

Airlines & Avionics Products
Honeywell International, Inc.
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Redmond, WA 98052

MK VII

Enhanced Ground Proximity Warning System (Class A TAWS)

Installation Design Guide

Part Numbers:

965-1076-001-XXX-XXX
965-1076-020-XXX-XXX
965-1076-030-XXX-XXX
965-1076-040-XXX-XXX
965-1076-060-XXX-XXX

All sheets are at the same revision level

Honeywell
MK VII EGPWS Installation Design Guide

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1.0 Introduction

The Honeywell MK VII Enhanced Ground Proximity Warning System (MK VII EGPWS) provides alerts to prevent controlled flight into terrain (CFIT) and for low altitude windshear conditions.

This Installation Design Guide must be used in conjunction with the Interface Control Document (ICD) Doc. No. 993-1076-401 for the MK VII Enhanced Ground Proximity Warning System (MK VII EGPWS) to select features and design the installation for this system.

The MK VII EGPWS ICD contains information required by MK VII EGPWS development personnel and not pertinent to the installation design process. Only items relevant to the installation design process are discussed in this document.

This document assumes a familiarity with avionics installation practices and aircraft systems associated with the installation and operation of the MK VII EGPWS. It also assumes access to pertinent aircraft wiring diagrams, modification records and manuals.

The information contained herein, together with general procedures outlined in FAA AC 43.13 must be followed carefully to assure a safe, electrically sound, certifiable and operational installation.

The contents of this document are for information and reference only and must not be construed as formal FAA approved work authorization.

1.1 Applicability

This manual is applicable only to MK VII EGPWS computers with the following part numbers:

965-1076-001-xxx-xxx	115 VAC
965-1076-020-xxx-xxx	115 VAC – with an internal GPS-PXPRESS card.
965-1076-030-xxx-xxx	+28 VDC – with an internal GPS-PXPRESS card.
965-1076-040-xxx-xxx	+28 VDC – with Heater Blanket.
965-1076-060-xxx-xxx	115 VAC – with an internal Mercury GNSS card.
960-2224	MKVII EGPWS System (+28 VDC, No internal GPS, with Heater blanket)
960-2225	MKVII EGPWS System (115 VAC, with internal GPS, No Heater blanket)
960-2226	MKVII EGPWS System (115 VAC, No internal GPS, No Heater blanket)
960-2230	MKVII EGPWS System (+28 VDC, with internal GPS, No Heater blanket)
960-2233	MKVII EGPWS System (115 VAC, with internal GNSS, No Heater blanket)

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1.2 Purpose

To provide guidance and information for selecting features, options and designing the installation interface for the EGPWS.

1.3 EGPWS System Overview & RAAS Option

The purpose of the Enhanced Ground Proximity Warning System is to help prevent accidents caused by Controlled Flight into Terrain (CFIT) or severe windshear. The RAAS option provides advisories that increase crew situational awareness during operation on and around airports. The system achieves this objective by accepting a variety of aircraft parameters as inputs, applying alerting algorithms, and providing the flight crew with aural alert messages and visual annunciations and displays in the event that the boundaries of any alerting envelope are exceeded.

The Product Specification describes all of the non-Runway Awareness & Advisory System (RAAS) system functions and design criteria for the Enhanced Ground Proximity Warning System (EGPWS). This document serves two major purposes. First, it describes the system functions for EGPWS customers. Secondly, it provides a system description for regulatory authorities. The optional RAAS function is described in detail in 060-4404-000 "Product Description, Runway Awareness and Advisory System (RAAS)".

1.4 How To Use This Document

Section 2 provides a system overview.

Section 3 provides information and instructions for selecting required features and for creating aircraft wiring diagrams for the MK VII EGPWS.

Section 4 provides mechanical installation details of the MK VII EGPWC and associated components. Sample parts list and Cockpit layout's.

Section 5 describes Post Installation tools for testing and other activities associated with the installation design include preparing a ground checkout procedure.

Section 6 Question and Answers - Troubleshooting and problems encountered during the installation or checkout. This document provides basic information and references to support these activities.

Section 7 defines Acronyms.

Section 8 MK II/VII GPWS (CLASSIC) To MK VII EGPWS (ENHANCED) Signal Mapping.

Appendix A contains sample wiring diagrams for selected aircraft configurations for reference.

Appendix B contains Customer Worksheets for the MK VII EGPWS and the RAAS function.

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1.5 Reference Documents

Following is a list of Honeywell reference documents:

965-0976-603	Product Specification for the Enhanced Ground Proximity Warning System
993-1076-401	Interface Control Document (ICD) for the MK VII Enhanced Ground Proximity Warning System (MK VII EGPWS)
960-2224	System, Enhanced Ground Proximity Warning (+28 VDC, -55° C)
960-2224-201	Outline, EGPWS Assembly (+28 VDC, -55° C)
960-2225	System, MK VII Enhanced Ground Proximity Warning (115 VAC) ^w /GPS Card
960-2225-201	Outline, EGPWS Assembly (115 VAC) ^w /GPS Card
960-2226	System, MK VII Enhanced Ground Proximity Warning (115 VAC)
960-2226-201	Outline, EGPWS Assembly (115 VAC)
960-2230	System, Enhanced Ground Proximity Warning (+28 VDC, -55° C) ^w /GPS Card
960-2230-201	Outline, EGPWS Assembly (+28 VDC, -55° C) w/GPS Card
960-2233	System, MK VII Enhanced Ground Proximity Warning (115 VAC) ^w /GNSS Card
960-2233-201	Outline, EGPWS Assembly (115 VAC) ^w /GNSS Card
060-4199-180	Line Maintenance Manual EGPWS MKV/MK VI/MK VII/MK VIII
060-4267-000	EGPWS Terrain Database Airport Coverage List
060-4241-000	Enhanced GPWS Pilot's Guide
011-2494	Mod Doc, Installation MK VII EGPWS ^w /GPS Card
060-4404-000	Product Description, Runway Awareness and Advisory System (RAAS)".

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1.6 General Specifications

Refer to the following table for general specifications for the MK VII Enhanced Ground Proximity Warning Computer.

CHARACTERISTIC	SPECIFICATION
Certification	FAA: TSO-C92c (GPWS) TSO-C117a (Windshear) TSO-C151a (Enhanced Functions) TSO-C129a (Mercury GNSS) UKCAA: Specification 14
Physical Size Dimensions: Markings/Identification Weight Mounting	2 MCU ARINC 600-6 form factor chassis H W L 7.64" x 2.43" x 12.76" (14.26" including handle) per ARINC 723-1 7.5 pounds (maximum) Rack mounted per ARINC 600-6 Vibration isolation or shock mounting not required
Reliability MTBF MTBUR	 ≥ 12,500 (operating) hours ≥ 11,250 (operating) hours
Power Input Type: 965-1076-001-xxx-xxx 965-1076-020-xxx-xxx 965-1076-030-xxx-xxx 965-1076-040-xxx-xxx 965-1076-060-xxx-xxx Requirement 965-1076-001-xxx-xxx 965-1076-020-xxx-xxx 965-1076-030-xxx-xxx 965-1076-040-xxx-xxx 965-1076-060-xxx-xxx	115 VAC/400 Hz 115 VAC/400 Hz +28 VDC +28 VDC 115 VAC/400 Hz 26 Watts with warning over 8Ω speaker 31 Watts with warning over 8Ω speaker 33 Watts with warning over 8Ω speaker 25 Watts with warning over 8Ω speaker * 40 Watts with warning over 8Ω speaker * 73.5 Watts with warning over 8Ω speaker and Heater Blanket On [Heater Blanket only applicable to 965-1076-040-xxx-xxx EGPWC which turns on at ≤ -20° C and off at ≥ -10° C.]

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CHARACTERISTIC	SPECIFICATION
Control Device (recommended): 965-1076-001/020/030/060 965-1076-040	2 Amp Delayed Action Circuit Breaker 5 Amp Delayed Action Circuit Breaker
Environmental Temperature range Operational 965-1076-001/-020/-030/-060 965-1076-040 Storage Altitude High Altitude Decompression Overpressure Cooling Humidity Shock Operational Crash Safety Impulse Sustained Radio Frequency Susceptibility	RTCA/DO-160C (DO-160D for 965-1076-060) -40 to +70 °C -55 to +70 °C -55 to +85 °C 55,000 feet 8,000 to 55,000 feet -15,000 feet Convection (no forced air cooling) 48 hours at 95% relative humidity 6 G's for 11 msec 15 G's for 11 msec (20 G's for 965-1076-060) 12 G's for 3 sec (20 G's for 965-1076-060) HIRF (radiated and conducted) (Category R)

Table 1.6-1 General Specifications

Note: Additional environmental information can be found in the EGPWS Product Specification, drawing number 965-0976-603 section 3.2.

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2.0 System Overview

The MK VII EGPWS provides aural and visual alerts to help prevent accidents caused by Controlled Flight Into Terrain (CFIT) during all phases of flight and for low-altitude windshear conditions. The system is designed for current generation aircraft that have primarily serial analog interfaces. A complete system description can be found in the *Product Specification for the Enhanced Ground Proximity Warning System*.

The MK VII Enhanced Ground Proximity Warning Computer (EGPWC) is designed to operate in a variety of aircraft configurations uniquely defined by the following:

- aircraft model
- cockpit display characteristics (sweep style and display)
- signal interfaces (analog, digital and discrete)
- non-operator-selectable features
- cockpit lamp configuration and mode (flashing or steady)
- windshear detection enabling

Figure 2-1 Enhanced Ground Proximity Warning System below shows the interfaces of the MK VII EGPWS.

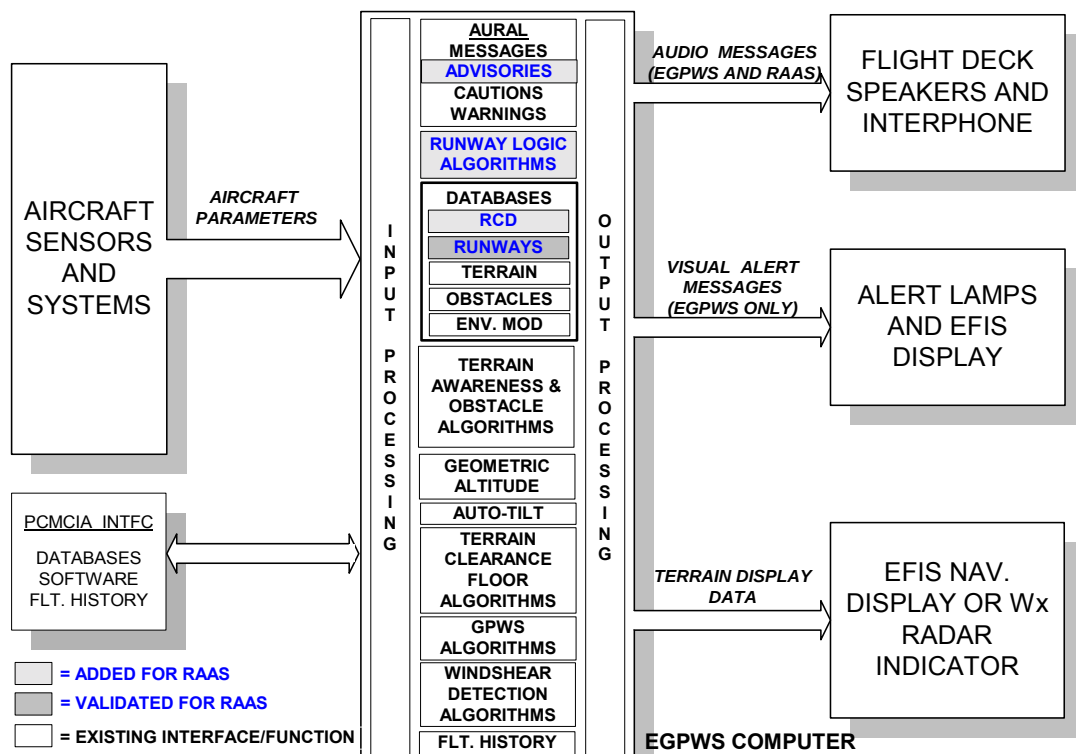


Figure 2-1 Enhanced Ground Proximity Warning System

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2.1 Runway Awareness and Advisory System (RAAS) Option

The Honeywell Runway Awareness and Advisory System (RAAS) offers significant safety enhancements for aircraft equipped with Honeywell's Mk V or Mk VII Enhanced Ground Proximity Warning Systems (EGPWS). Honeywell's Runway Awareness and Advisory System is a software enhancement hosted in the EGPWS Unit. RAAS uses GPS position data and the Honeywell EGPWS Database to provide aural advisories that supplement flight crew awareness of position during ground operations and on approach to landing. EGPWS protection and operation is unaltered by the addition of RAAS. RAAS installation is accomplished via an enabling "key" and loading a configuration database. The installation does require that the EGPWS has a source of GPS data, Terrain Database version 435 or later, and the RAAS Configuration Database (RCD) is loaded. When enabled, RAAS operates automatically, without any action required from the flight crew. RAAS availability can be verified by performing an EGPWS self test.

- Previously installed Enhanced Ground Proximity Warning Computer (EGPWC), with the following interfaces:
 - Aircraft sensors and other systems providing input signals, including a direct connection to GPS
 - Flight deck audio systems (speakers and interphone)
 - Alert lamps and/or digital outputs to EFIS displays (for alert messages)
 - EFIS Navigation Display (ND) or weather radar indicator for display of terrain
- EGPWS Software Version 218-218 or later, with RAAS enable "key" set or EGPWS Software Version 965-1690-051 or later, with RAAS enable "key" set
- Terrain Database 435 or later
- RAAS Configuration Database (configuration database to activate RAAS and specify options)

NOTE: RAAS is not compatible with earlier versions of EGPWS software or Terrain Database.

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3.0 Feature Selecting and Electrical Interfacing

This section provides information for selecting features and wiring the electrical interfaces of the MK VII EGPWS.

*ICD Section 5.2 groups features (functions) into sets called Categories. **This document follows the Category structure of the ICD.** It provides descriptions of the features and instructions for selecting features and for determining the correct wiring.*

Sample wiring diagrams for the most commonly used MK VII EGPWS configurations are provided in Appendix A.

Important preparation!

*** Make copies of ICD Table 5-1 and Figure 5.1 to use for recording feature selections.**

Section 8 provides a cross-reference between the MK II GPWC and the MK VII EGPWS (Enhanced) interfaces. Section 9 provides a cross-reference between the MK VII GPWS and the MK VII EGPWS (Enhanced) interfaces.

3.1 System Wiring

System wiring is broken down into the following main components:

- Electrical Interfaces (power and ground)
- Program Pins
- Analog and Digital Inputs
- Discrete Inputs
- Serial Outputs
- Audio Outputs
- Discrete Outputs

Many of these inputs and outputs will be defined as the Categories are selected for Program Pin strapping. *ICD Table 8-1* shows the typical usage for each pin on the Lower (J1), Middle GPS Coax Connector (J3) and Upper (J2) rear connectors and provides a place for recording the actual usage for this installation.

3.1.1 Electrical Interfaces

The MK VII EGPWC requires a primary power input (either 115 VAC or 28 VDC input power depending on the MK VII EGPWC part number being installed) *ICD 4.2.4.1* and ground. *ICD Section 4.2.14* MK VII EGPWC also provides a 5 VDC reference output that may be used as an excitation voltage for an external device.

3.1.2 Primary Power Input

Primary power should be connected as follows for both the 115 VAC and 28 VDC versions of the MK VII EGPWC.

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Note: Because of Configuration on power up, the 28V lamp bus and the primary power (115V or 28 V) should be on the same avionics bus. Installers should ensure that J1B-39 is not connected to 115 VAC.

Pin	Signal
J1B-03	Power Hi (+)
J1B-04	Power Low (ground)

End Item Part Number			
	965-1076-001-xxx-xxx		
	965-1076-020-xxx-xxx	965-1076-030-xxx-xxx	965-1076-040-xxx-xxx
	965-1076-060-xxx-xxx		
EGPWC Input Power Type	115 VAC/400 Hz	28 VDC	28 VDC
Recommended EGPWC Power Control Device	2 Amp Delayed Action Circuit Breaker	3 Amp Delayed Action Circuit Breaker	5 Amp Delayed Action Circuit Breaker

3.1.3 Chassis Ground

Chassis ground provides a redundant metal connection and should not be used as a normal current carrying conductor. Chassis ground should be connected as follows:

Pin	Signal
J1B-05	GND_C

3.1.4 Program Pins

Program Pins define the functional operation environment of the MK VII EGPWC including the aircraft make and model, electrical interfaces and feature selections. Each of the 24 Program Pin can be set to one of 10 states by strapping each Program Pin to one of eight MK VII EGPWC output discretes, strapping it to ground or leaving the connection open. During power-up initialization, the MK VII EGPWC cycles the states of these output discretes to determine its operating configuration.

ICD Figure 5.1 shows the possible connections for each Program Pin. This figure is used to record the Program Pin strapping information that will be required for generating wiring diagrams. See www.egpws.com for Program Pin Strapping Utility.

NOTE: To ensure proper Program Pin operation, the cold lamp resistance of each of the eight EGPWS discrete outputs used to set the program pins must be 15Ω or greater.

Limitations: The described use of program pins provides for maximum flexibility in selection of input sensors and output behavior. Every attempt has been made to avoid pin assignment

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conflicts between categories, to reflect the known configurations of aircraft and to minimize wiring changes when upgrading from an existing GPWS installations. However, in the case of input sensors (Categories 1 through 6), it should not be construed that all possible combinations are valid configurations. There may be combinations that produce pin assignment conflicts or may not be supported by the EGPWS software configurations building process (in this case the MK VII EGPWS will fail). In general, you cannot achieve redundancy by mixing both analog and digital signals sources. Redundant digital signals on different buses are allowed. As it is not practical to verify all possible sensor combinations, verification of particular sensor combinations is part of the installation certification process.

3.1.5 Analog and Digital Inputs

The analog and digital inputs to the MK VII EGPWS are defined as the Categories are selected. Instructions for documenting these interfaces are provided with the Category selection instructions, contained in the ICD.

3.1.6 Discrete Inputs

The discrete inputs are defined in *ICD Section 6.4*. Each, discrete input is mapped by the aircraft configuration to a specific function. Additional information for some discretes is provided with the Category in which they are used.

3.1.7 Serial Outputs

The EGPWC provides for ARINC 453 and ARINC 429 serial outputs.

Terrain display data is output on two ARINC 453 channels when the Terrain Awareness display function is enabled.

Specific low speed ARINC 429 output labels provided by the EGPWC are listed in *ICD Section 7 (also called Appendix B)*. The ARINC 429 output data includes:

1. Internal data (data output for test purposes only such as Radio Altitude used, Computed True Airspeed and Corrected AOA information).
2. Alert/Warning status (Voice and Lamp activity can be provided to EFIS, EICAS, and flight recorders).
3. Internal Mode Status: Various internal EGPWC mode logic is transmitted for test purposes.
4. Terrain Display Messages for TAD cockpit integration.

NOTE: During EGPWS Self Test, the SSM of each output label is set to the Functional Test status code.

3.1.8 Audio Output

Audio output messages are provided as specified in the selected Audio Callout Menu (Category 13) which are defined in *ICD Section 7.2*.

When inputs are valid and the audio suppression discretes are disabled.

When audio suppression is enabled, the output discrete(s) associated with a suppressed message are activated unless both audio and visual suppression is enabled.

The audio outputs consist of both an 8-ohm amplifier and a transformer isolated 600-ohm output.

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There are 3 audio output amplifiers. One amplifier drives a 600-ohm headphone jack located on the front panel of the unit labeled "HEADPHONES", that can be used to activate all of the self-test features. The audio jack outputs the same output voices (words) that are enunciated in the cockpit at 6db higher output level. Another amplifier drives a transformer-isolated 600-ohm output intended for the aircraft audio system. The third amplifier drives an 8-ohm output intended for the aircraft cockpit speaker.

NOTE: The 8-ohm speaker output is connected to J1B-14 in many MK VII GPWS installations. When using the EGPWS 8-ohm audio output, the 8-ohm speaker LOW cannot be connected to J1B-14. It must be tied to a DC ground, closest to the speaker.

3.1.9 Discrete Outputs

The MK VII EGPWS provides for up to thirteen 0.5 amp (1 amp maximum) discrete outputs. The discrete outputs (Category 14) are defined in *ICD Section 7.3*.

The discrete outputs are optional if the ARINC 429 output data is used for driving the alert/warning lamps via a symbol generator. Most Aircraft Types do not use the ARINC 429 output data for lamp control. (This data is typically sent to the Flight Data Recorder).

All outputs to lamps are driven by solid state switches to ground. These outputs can also be used as discrete drivers for other devices (e.g. the EFIS symbol generator, terrain display switching).

NOTE: To ensure proper Program Pin operation, the cold lamp resistance of each of the thirteen EGPWS discrete outputs must be 15 Ω or greater.

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3.2 Category 1 - Aircraft Type

Category 1 uses Program Pins 21 and 20 to specify the aircraft model (also called the Aircraft Type Select), windshear and bank angle callout enabling and the Angle of Attack and Flaps interfaces for the installation.

MK VII EGPWS ICD Tables 5.2, 5.2.1 and 5.2.1-xx include information required by MK VII EGPWS development personnel and pertinent to the installation design process. Only items relevant to the installation design process are discussed in this document.

3.2.1 Aircraft Type

The Aircraft Type identifies the aircraft model for the installation. A single aircraft model may have several Aircraft Types to allow for different configurations. Generic Aircraft Types are also defined for Commercial Air Transport, Business Jet and Turbo Prop aircraft.

Some Aircraft Types include the word “Simulator” in their names. These Aircraft Types allow instantaneous repositioning (using the latitude and longitude inputs) for simulator installations. Stationary laboratory installations do not require the simulator repositioning capability and can use Aircraft Types that do not support instantaneous repositioning. Non-simulator Aircraft Types can be used in a simulator environment provided instantaneous repositioning is not used.

NOTE: If EGPWS is to provide reactive windshear detection, it is required that the exact aircraft type is selected.

If EGPWS is Not to provide reactive windshear detection, use one of the generic aircraft types.

A/C Type 3 – No Windshear - Turbo Prop A/C

A/C Type 4 – No Windshear - Bizjet A/C with Alternate Mode 4 (for small bizjets).

A/C Type 5 – No Windshear - Air Transport A/C

A/C Type 7 – No Windshear - Bizjet A/C with Normal Mode 4 (for large bizjets).

NOTE: The No Windshear A/C types above will activate WS INOP bits in EGPWS ARINC 429 output for Integrated EFIS aircraft use -212-212 and earlier software. This was corrected in -213-213 and later software. This may cause nuisance WS INOP indications in EFIS aircraft with -212-212 or earlier software.

ICD Table 5.2.1 lists the Aircraft Types by Aircraft Type number. This table shows the aircraft model for each Aircraft Type, whether the MK VII EGPWS reactive Windshear is disabled and the first version in which the Aircraft Type was available. This table also shows the Program Pin strapping for each Aircraft Type.

ICD Tables 5.2.1-x, where x is the Aircraft Type number, define each Aircraft Type in detail. Entries in *ICD Tables 5.2.1-x* that are relevant to the feature selection and installation design process are described in the sections below.

3.2.2 Windshear Enabling

The Aircraft Type defines reactive Windshear detection and annunciation activation. If the Aircraft Type activates the Windshear function, it can be modified via Category 12 Program Pin strapping to disable the Windshear Caution Voice only. (See Note in Section 3.13 Category 12 regarding Caution Voice only disable).

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ICD Table 5.2.1 identifies the aircraft model and Windshear enabling for each Aircraft Type. The Aircraft Type defines whether the MK VII EGPWS reactive Windshear is enabled or disabled. If the MK VII EGPWS reactive Windshear function will not be used, select the appropriate non-windshear Aircraft Type (3, 4, 5, 7 or specific non-windshear Aircraft ID).

NOTE: If Reactive Windshear Detection is desired, but appropriate A/C is not defined in the A/C type table, contact Honeywell.

3.2.3 AOA & FLAP Interfaces

AOA and Flaps interfaces are detailed in *MK VII ICD Tables 5.2.1.1-xx*. To determine which of these tables corresponds to the Aircraft Type, use the number shown for AOA/Flaps Type Row "Possible States" column in *Table 5.2.1-x* (where x is the Aircraft Type number). This is the AOA/Flaps Type number.

ICD Table 5.2.1.1-xx, where xx is the AOA/Flaps Type number, details the AOA and Flap Angle interfaces.

NOTE: If MK VII EGPWS reactive Windshear is disabled, the AOA and Flaps interfaces are not required in most cases.

3.2.4 Audio Inhibit Monitoring

ICD Table 5.2.1-x defines whether Audio Inhibit Monitoring is performed. (The "Possible States" is either a "Yes", monitoring will be performed, or a "No", monitoring will not be performed).

Audio Inhibit Monitoring will result in the "All Modes Inhibit" fault when the Audio Inhibit discrete input is activated for more than 60 seconds and either of the following conditions are true:

- audio and visual EGPWS suppression is enabled, or
- the Aircraft Type enables Audio Inhibit Monitoring (refer to the selected Category 1 definition in the ICD).
- The function of this discrete is controlled by the Category 5 selection. When activated, this discrete always inhibits all audio except for the windshear warning. If configured via the Category 5 selection to suppress the visual outputs in addition to the audio outputs, activation of this discrete will suppress all visual and audio outputs except for windshear warning.

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3.2.5 Instructions

Using <i>ICD Tables 5.2.1-x and 5.2.1.1-xx</i> as described above, select the Aircraft Type that matches the aircraft configuration and feature preferences (including AOA and Flaps interfaces). • If the MK VII EGPWS reactive windshear will not be enabled, use Aircraft Type 3 for all Turbo Prop aircraft, Aircraft Type 4 for all Business Jet and General Aviation aircraft and Aircraft Type 5 for all Commercial Air Transport aircraft. • For simulator installations, select an Aircraft Type targeted for a simulator.
Record the ID/Aircraft Type number from <i>ICD Table 5.2.1</i> under the Ident No. heading for Step (Category) 1 in <i>ICD Table 5.1</i>. <i>Make a copy of ICD Table 5-1 & Figure 5.1 for selection recording of interface categories.</i>
Record the PP 21 and PP 20 States from <i>ICD Table 5.2.1</i> under the appropriate PROG. PIN/STATE headings for Step (Category) 1 in <i>ICD Table 5.1</i>.
Record the Ident. No. from <i>ICD Table 5.2.1</i> under the ID heading for Category 1 in <i>ICD Figure 5.1</i>.
Fill in the connections for Program Pins 21 and 20 in <i>ICD Figure 5.1</i>. (<i>ICD Figure 5.2-3</i> shows how this should be done.)
The electrical interfaces (pin-outs) for the AOA/Flap Angle Data are shown in <i>ICD Table 5.2.1.1-xx</i> and are used to generate the installation wiring diagrams.

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3.3 Category 2 – Radio Altitude and Decision Height Inputs

Category 2 uses Program Pin 14 to define the Radio Altimeter interface and availability of ARINC 429 Decision Height. Radio Altitude is the primary input for the basic modes 1-5, mode 6 callouts, and Terrain Clearance Floor. It is also used to enable the windshear function, and as part of the geometric altitude computation.

ICD Table 5.2.2 defines the Radio Altimeter (RA) interface options (called Radio Altitude Input Select) and identifies the first MK VII EGPWS version in which the option was available (see the Effectivity entry).

ICD Tables 5.2.2-x, defines each Radio Altimeter Input Select Type number, for the electrical interfaces required to support each RA Type.

NOTE: The ARINC 429 Decision Height input availability is controlled by this Category. This input determines the availability of particular Altitude Callout menus (Category 8).

NOTE: ID-7 (added in –208/-208) the ARINC 429 DH input is incorrectly defined and will not work-DO NOT USE. This is corrected in the –212-212 software.

NOTE: Potential electrical interface conflicts may exist between options in different Categories.

3.3.1 Decision Height Discrete Input

The Decision Height discrete indicates to the MK VII EGPWC whether the aircraft is above or below the selected Decision Height. The Decision Height input (via this discrete or ARINC 429 Decision Height) must be provided if the selected Altitude Callout menu includes a “Decision Height”, “Minimums” or “Decide” callout.

This discrete is typically connected to the Decision Height output on the Radio Altimeter indicator. There are up to 3 possible sources of decision height, depending on aircraft configuration. There are single/dual Selected DH, or single/dual/triple Selected DH/MDA, or a discrete source.

3.3.2 Decision Height/MDA Digital Input

This Input is required to annunciate the “Approaching” Minimums style callouts. See Category 8 for further details.

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3.3.3 Instructions

Review <i>ICD Table 5.2.2</i> to determine which options are available for the MK VII EGPWS version (part number) being installed.
Select the available Radio Altitude Type that matches the aircraft configuration.
Record the RA Type number from <i>ICD Table 5.2.2</i> under the Ident No. heading for Step (Category) 2 in <i>ICD Table 5.1</i> .
Record the PP 14 State from <i>ICD Table 5.2.2</i> under appropriate PROG. PIN/STATE headings for Step (Category) 2 in <i>ICD Table 5.1</i> .
Using the Radio Altitude Type number from <i>ICD Table 5.2.2</i> as x, go to <i>ICD Table 5.2.2-x</i> .
The electrical interfaces (pin-outs) for Category 2 are shown in <i>ICD Table 5.2.2-x</i> . • NOTE: The Configuration Data in <i>ICD Table 5.2.2-x</i> may be disregarded.

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3.4 Category 3 – Air Data Inputs

Category 3 uses Program Pins 6 and 15 to select the Air Data interface.

ICD Table 5.2.3 defines the Air Data interface options (called Air Data Select) and identifies the first MK VII EGPWS version in which the option was available (see the Effectivity entry).

ICD Tables 5.2.3-x, where x is the Air Data Type number, define the electrical interfaces required to support each Air Data Type.

NOTE: Potential electrical interface conflicts may exist between options in different Categories.

NOTE: AZ-241 ADCs should use ID 29 (requires –212-212 or later).

NOTE: IDs without Corrected Baro require GPS directly connected to EGPWS and software – 206-206 or later to ensure fully enhanced Geometric Altitude functionality.

3.4.1 Instructions

Review <i>ICD Table 5.2.3</i> to determine which options are available for the MK VII EGPWS version (part number) being installed.
Select the available Air Data Select type that matches the aircraft configuration.
Record the Air Data Type number from <i>ICD Table 5.2.3</i> under the Ident No. heading for Step (Category) 3 in <i>ICD Table 5.1</i> .
Record the PP 6 and PP 15 States from <i>ICD Table 5.2.3</i> under appropriate PROG. PIN/STATE headings for Step (Category) 3 in <i>ICD Table 5.1</i> . NOTE: Pay particular attention to the interface notes referenced in <i>Table 5.2.3</i>. use of certain Air Data types require GPS as a position source.
Using the Air Data Type number from <i>ICD Table 5.2.3</i> as “x”, go to <i>ICD Table 5.2.3-x</i> .
The electrical interfaces (pin-outs) for the Air Data Select Type are shown in <i>ICD Table 5.2.3-x</i> and are used to generate the installation wiring diagrams.

3.5 Category 4 – Attitude/Acceleration Data and Flashing Lamps

Category 4 uses Program Pins 13 and 16 to select the Attitude and Acceleration data and to enable flashing lamps.

ICD Table 5.2.4 defines the Attitude/Acceleration Input options (called Attitude/Acceleration Select and Flashing Lamp) and identifies the first MK VII EGPWS version in which the option was available (see the Effectivity entry).

3.5.1 Attitude/Acceleration Data

ICD Tables 5.2.4-x, where x is the Attitude/Acceleration Input Select **Type**, define the electrical interfaces required to support each Attitude/Acceleration Input Select Type.

NOTE: Potential electrical interface conflicts may exist between options in different Categories.

3.5.2 Flashing Lamps

Flashing cockpit lamps are available for some MK VII EGPWS outputs as defined in Section 3.15 (Category 14). Flashing lamps are enabled by selecting an Attitude/Acceleration Input Select ID number in ICD Table 5.2.4-x with a “Y” under the Flashing Lamps heading.

3.5.3 Instructions

Review ICD Table 5.2.4 to determine which options are available for the MK VII EGPWS version (part number) being installed.

Select the available Attitude/Acceleration Input Select that matches the aircraft configuration.
--

Record the Attitude/Acceleration Input Select ID number from ICD Table 5.2.4 under the Ident No. heading for Step (Category) 4 in ICD Table 5.1.
--

Record the PP 16 and PP 13 States from ICD Table 5.2.4 under appropriate PROG. PIN/STATE headings for Step (Category) 4 in ICD Table 5.1.

Using the Attitude/Acceleration Input Select ID number from ICD Table 5.2.4 as “x”, go to ICD Table 5.2.4-x.
--

The electrical interfaces for the Attitude/Acceleration Input Select Type are shown in ICD Table 5.2.4-x) and are used for generating the installation wiring diagrams.

NOTE:

1. If installation does not use Reactive Windshear (e.g. A/C Types 3,4,5,7), the Acceleration inputs are ignored by the EGPWS. Select the appropriate Attitude source without regard to Acceleration type.
2. When performing a Level 3 (EGPWS Configuration), Self-Test the “Attitude and Acceleration Type” message will enunciate the (Table #) of the Attitude / Acceleration input select (Table 5.2.4-xx) and NOT the ID number. See Example Below.

EXAMPLE: ID 9 Selects “Attitude / Acceleration” input Table 4 (5.2.4-4) and Flashing Lamps. A level 3 self-test will enunciate “Attitude and Acceleration Type” 4 “Flashing Lamps Selected”.

3.6 Category 5 – Navigation Input Select

Category 5 uses Program Pins 17 and 9 to control the selection of the Glideslope and Localizer interfaces and defines the activation of the QFE Select, EGPWS Suppress, Glideslope Cancel Type and Glideslope FW Enable features.

NOTE: Potential electrical interface conflicts may exist between options in different Categories.

3.6.1 Navigation Input Select (Glideslope & Localizer Inputs)

ICD Table 5.2.5 defines the Category 5 Navigation Inputs Select options (called Navigation Inputs Select) and identifies the first MK VII EGPWS version in which the option was available.

(See the Effectivity entry). The Navigation Inputs Select numbers are found under the Navigation Input Select column heading.

ICD Tables 5.2.5-x, where x is the Navigation Inputs Select number, define the electrical interfaces required to support each Glideslope and Localizer interfaces defined for the Navigation Inputs.

3.6.2 AltitudeCorrection (QFE)

Corrected Barometric Altitude can be measured relative to mean sea level (QNH) or field (runway) elevation (QFE). Selection of the altitude correction method should be based on how and where the aircraft will be operated. If the aircraft operates in a QFE environment full-time, select QFE. Once configured, the altitude correction selection is permanent.

QNH is barometric altitude corrected to mean sea level and is the most common correction format. QFE is barometric altitude corrected to read zero feet at the runway regardless of the mean sea level altitude of the runway.

NOTE: A “No” entry for QFE Select in *ICD Table 5.2.5-x* indicates that QNH is selected (QFE is NOT selected).

3.6.3 EGPWS Suppress (Non-Windshear Audio and/or Visual Suppression)

The Audio Inhibit discrete (Category 14) is an optional input but is strongly recommended to maintain audio and visual prioritization. If Non-Windshear EGPWS Suppression is disabled, the Audio Inhibit discrete (Category 14) is not required; otherwise it is required.

The function of this discrete is controlled by the Category 5 selection. When activated, this discrete always inhibits all audio except for the windshear warning. If configured via the Category 5 selection to suppress the visual outputs in addition to the audio outputs, activation of this discrete will suppress all visual and audio outputs except for windshear warning.

Activation of the Audio Inhibit input for more than 60 seconds will result in the “All Modes Inhibit” fault (*ICD Sections 6.4.18 and 6.4.19*) for Aircraft Type Select when either of the following conditions are true:

- audio and visual EGPWS suppression is enabled, or
- the Aircraft Type enables Audio Inhibit Monitoring (refer to the selected Category 1 definition in the ICD). The Audio Inhibit discrete input can be connected to any or all of the following (as applicable to the Aircraft Type):

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- o the Stall Warning computers (this is required for CAA-registered aircraft)
- o the PWS Audio Inhibit output discrete if Hazard bus label 077 is used (To determine which Hazard bus label is used, refer to the *Interface Control Document* for the Hazard bus definitions for the selected Aircraft Type.)
- o a separately labeled guarded cockpit switch
- o a reactive Windshear system if separate from the EGPWS.

NOTE: For some existing GPWS installations, this discrete may have been tied to the analog Radio Altimeter Receiver-Transmitter Self-Test output. This connection is no longer required but may be left intact for this installation.

NOTE: If EGPWS Suppression is not desired, do not connect the Audio Inhibit discrete.

Recommendation: Honeywell recommends the use of the Audio Inhibit feature to maintain appropriate audio and visual prioritization in the cockpit.

The EGPWS Suppress entry in *ICD Table 5.2.5-x* indicates the EGPWS Suppression defined for Navigation Input Select Type.

3.6.4 Glideslope Cancel Type

The Standard Glideslope Cancel logic allows the crew to manually cancel the “Glideslope” caution when below 2000 feet Radio Altitude. The Glideslope Cancel is automatically reset when ascending above 2000 feet Radio Altitude or descending below 30 feet. For some Aircraft Types, The crew can manually cancel the “Glideslope” alert when below 1000 feet. For these Aircraft Types, the automatic Glideslope Cancel Reset altitude is also 1000 feet. The Aircraft Type's Glideslope Cancel Reset entry defines the Glideslope Cancel altitude.

The Alternate Glideslope Cancel logic allows the crew to manually cancel and re-activate the “Glideslope” alert any time at any altitude. It is automatically reset when the aircraft is on the ground or is configured for a Go-Around (flaps or gear up). **Alternate Glideslope Cancel requires a cockpit annunciation that this cancel is in effect. The Alternate G/S Cancel is NOT Certifiable for FAA Part 121 Operations.**

The Alternate Glideslope Cancel is manually reset by pressing the G/S CNCL switch. Note that the cockpit (G/S CNCL) annunciation will extinguish.

The Glideslope Cancel Type entry in *ICD Table 5.2.5-x* indicates whether the Standard or Alternate Glideslope Cancel is defined for Navigation Inputs Select.

3.6.5 Glideslope FW Enable

This item is currently not used.

3.6.6 ILS Tuned Discrete Input #1 and #2 (GND/+28V)

The ILS Tuned Discrete #1 indicates that a Instrument Landing System frequency has been selected on ILS #1. The ILS Tuned Discrete #2 indicates that an Instrument Landing System frequency has been selected on ILS #2. These discretes are typically used with analog Glideslope and Localizer inputs. When an ILS is tuned, the MK VII EGPWS checks the Glideslope and Localizer Valid discretes and monitors the Glideslope and Localizer inputs.

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NOTE: For Navigation input Select ID # 2 & 4, The ILS Tuned Discrete #1 (GND) at J1A-03 and ILS Tuned Discrete #2 (GND) at J2-F13 are NOT supported prior to the –208-208 software.

3.6.7 Instructions

Using *ICD Tables 5.2.5 and 5.2.5-x* as described above; select the Navigation Inputs Select that matches the aircraft configuration and feature preferences.

Review *ICD Table 5.2.5* to determine which options are available for the MK VII EGPWS version (part number) being installed.

Select the available Navigation Inputs Select that matches the aircraft configuration.

Record the Navigation Inputs Select Type number from *ICD Table 5.2.5* under the Ident No. heading for Step (Category) 5 in *ICD Table 5.1*.

Record the PP 17 and PP 9 States from *ICD Table 5.2.5* under appropriate PROG. PIN/STATE headings for Step (Category) 5 in *ICD Table 5.1*.

Using the Navigation Inputs Select number from *ICD Table 5.2.5* as “x”, go to *ICD Table 5.2.5-x*.

The electrical interfaces for the Navigation Inputs Select Type are shown in *ICD Table 5.2.5-x* and are used to generate the installation wiring diagrams.

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3.7 Category 6 – Position Input Select (GPS, FMC and IRS Interfaces)

Category 6 uses Program Pins 18 and 1 to select the GPS, FMC and IRS interfaces.

ICD Table 5.2.6 defines the Position Input Select options (called Position Input Select Types) and identifies the first MK VII EGPWS version in which each option was available (see the Effectivity entry).

ICD Table 5.2.6-x, where x is the Position Input Interface ID number, details the Global Positioning System (GPS), Flight Management Computer (FMC) and Inertial Reference System (IRS) interfaces, including ARINC 429 channels and required data content. The internal GPS is selected here if the MK VII EGPWS part number being installed provides this feature.

Category 6 controls the selection of the GPS, FMC and IRS interfaces.

NOTE: Potential electrical interface conflicts may exist between options in different Categories.

NOTE: Effectivity showing “Future” is not available for use. Please choose IDs carefully!

3.7.1 Instructions

Review *ICD Table 5.2.6* to determine which Position Input Select are available for the MK VII EGPWS version (part number) being installed.

NOTE: If the effectivity column state “future”, the Position source ID is not available. Selecting an (invalid Position Input select) ID with “future” effectivity will result in a fault.

Select the available Position Input Select type that matches the aircraft configuration.

Record the Position Input Select ID number from *ICD Table 5.2.6* under the Ident No. heading for Step (Category) 6 in *ICD Table 5.1*.

Record the PP 18 and PP 1 States from *ICD Table 5.2.6* under appropriate PROG. PIN/STATE headings for Step (Category) 6 in *ICD Table 5.1*.

Using the Position Input Select ID number from *ICD Table 5.2.6* as “x”, go to *ICD Table 5.2.6-x* and verify the GPS, FMC and IRS interfaces support the required bus data.

NOTE: If the Position Input select ID contains more than one interface table, all interfaces and signals are required.

The electrical interfaces for the Position Input Select ID are shown in *ICD Table 5.2.6-x*.

3.8 Category 7 – Terrain Display Select

Category 7 uses Program Pins 19 and 2 to control:

- The enabling of Terrain Awareness & Display (TA&D) and the Terrain Clearance Floor (included as part of the display configuration).
- The selection of the display configuration, which also determines Peaks mode *availability* (Peaks mode *enabling/disabling* is controlled by Category 17).
- The selection of external inputs associated with the chosen display (such as Weather Radar Range and the EFIS Display Mode).
- The definition of the EGPWS ARINC 429 output data.

Each of the options controlled by Category 7 are described below.

ICD Table 5.2.7 defines the combinations of options available. *ICD Display Configuration Group Tables, Display Input Control Group Tables* and *Output 429 Bus Group Tables* detail the display configuration, inputs and outputs respectively.

NOTE: The “Effectivity” column, on the right side of *ICD Table 5.2.7*, indicates the minimum software version for the EGPWS that supports the display. The “Display Type” column will indicate if Peaks mode is available for the display. Peaks mode is not always available at the same time as the display. The “Peaks Mode” column of the “Display Configuration Group” will indicate the minimum software version for Peaks mode if it is not the same as the initial display.

3.8.1 TA&D and TCF Selection (Category 7)

The Terrain Awareness & Display (TA&D) feature consists of a Terrain Awareness Alerting feature and a Terrain Awareness Display feature. The Terrain Awareness Alerting feature continuously computes terrain clearance envelopes ahead of the aircraft and issues alerts if the boundaries of these envelopes conflict with terrain elevation data in the terrain database. The TA&D feature displays the data terrain relative to aircraft altitude.

The Terrain Clearance Floor (TCF) algorithm identifies premature descent for approaches regardless of aircraft configuration. It creates a terrain clearance envelope around the airport to provide protection against controlled flight into terrain situations beyond that of the basic GPWS.

ICD Table 5.2.7 defines if TA&D and TCF are disabled or enabled. Refer to the “Display Type” column.

NOTE: If you do not have a display you must still enable TA&D and TCF by using Category 7, ID 1 to enable Terrain alerting.

3.8.2 Terrain Display Configuration Group (Category 7)

ICD Table 5.2.7 defines a specific Display Configuration Group for each Terrain Display Select ID. The *Display Configuration Group Tables* in *ICD Section 5.2.7.1* describes each display configuration in detail including the Terrain picture ARINC 453 output bus interface.

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A definition of each of the entries in these tables is provided in the table below.

Function	Value
Display Type	Display manufacturer, model, etc.
Sweep Type	The type of sweep used for terrain data (fan, standard radar, etc.)
Auto Pop Up	Category 10, Options Select Group #1
	TA&D Alternate Pop Up: False TA&D Alternate Pop Up: True
	The TA&D Alternate Pop Up is set to False or True in Category 10. If False, Pop Up behavior for the terrain display is described here. The TA&D Alternate Pop Up is set to False or True in Category 10. If True, Pop Up behavior for the terrain display is described here.
Peaks Mode	Category 17, Options Select Group #4
(Available in -xxx-xxx) If not part of the original display release.	Peaks Enable: False Peaks Enable: True
	Peaks Enable is set to False or True in Category 17. The effect of setting it to False is described here. Peaks Enable is set to False or True in Category 17. The effect of setting it to True is described here.
Manual select	Describes if/when terrain display(s) can be manually selected. This implies that the EGPWS controls the display selection.
Manual deselect	Describes if/when terrain display(s) can be manually deselected. This implies that the EGPWS controls the display deselection.
Auto Range	Indicates if the Terrain display range is automatically scaled to a set range at the beginning of a Terrain Alert condition (the set range, usually 10 nautical miles, will also be indicated).
Moving Marker	Indicates if a moving marker is provided. A moving part is used to indicate Terrain display activity by having a colored line at the bottom (horizontal) or top (as an arch), with a narrow colored band moving back and forth on it. Most displays <u>do not</u> use this feature.
Overlay Page	Describes the location of annunciations that can be displayed as part of the Terrain picture by the EGPWS. These "overlays" are supplied for displays that are not able to display annunciations as "stroked" characters using data digitally encoded on the ARINC 453 or 429 data buses. In non-Peaks mode a "TERR" will usually be displayed if Terrain is selected; in Peaks mode the Peaks Elevations will be displayed.
Display Priority	This is only used if you have Weather Radar Predictive Windshear (PWS). It is used to indicate the priority for displaying Terrain and PWS alerts. For example: Standard (PWS Warn, Terrain Warn, PWS Caution, and Terrain Caution).
Searchlights	Unused feature; always indicates "No".
Display bus type	Defines the display bus type: The actual Bus definition is always ARINC 453; however, there are 3 different data formats that are currently used; standard Weather Radar ARINC 708, Honeywell Picture bus, and KCPB.
Terrain Inhibit Monitoring (set fault after 5 seconds)	If "Yes" it Indicates that the Terrain Display INOP Discrete (Monitor) will turn on 5 seconds after the Terrain Awareness & TCF Inhibit switch is grounded (Terrain Inhibited).
CHANNEL TX453-1	CONNECT TO:
A = J1A-15 B = J1A-16	Indicates the output pins for the Terrain Display Bus #1
CHANNEL TX453-2	CONNECT TO:
A = J1B-35 B = J1B-36	Indicates the output pins for the Terrain Display Bus #2

Table 3.8.2-1 Definition of Display Configuration Group Tables (ICD Section 5.2.7)

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3.8.3 Display Input Control Group

ICD Table 5.2.7 defines a specific Display Input Control Group for each Terrain Display Select ID. The *Display Input Control Group Tables* in *ICD Section 5.2.7.3* define the electrical interfaces the MK VII EGPWC requires to properly control and output data to the display. This may include both ARINC 429 and discrete input interfaces.

3.8.4 Output 429 Bus Group

ICD Table 5.2.7 identifies a specific Output 429 Bus Group definition for each Terrain Display Select ID. The *Output 429 Bus Group Tables* in *ICD Section 5.2.7.2* defines the data the MK VII EGPWC will transmit on the ARINC 429 Low Speed output channel.

NOTE: The Output 429 bus is not required for all displays. Display ID's 4, 13, 14, 20, 21, 32, 34, and 35 will require a connection to Output 429 bus.

3.8.5 Instructions

Using *ICD Table 5.2.7* and the *Display Configuration Group Tables*, *Display Input Control Group Tables* and *Output 429 Bus Group Tables* as described above, select the Terrain Display Select Type (ID) that matches the aircraft configuration, feature preferences and version (part number) being installed.

Record into *ICD Table 5.1* under the "Ident No." column for Step (Category) 7 the "Terrain Display Select" type (ID) number for your display from *ICD Table 5.2.7*

Record into *ICD Table 5.1* under the "PROG. PIN/STATE" columns the PP 19 and PP 2 States from *ICD Table 5.2.7*.

From *ICD Table 5.2.7* find the *Display Configuration Group* number for the selected display ID and record it here. → _____.

NOTE: We will use the *Display Configuration Group* number later to determine Peaks Mode availability for Category 17.

Using the *Display Configuration Group* number from *ICD Table 5.2.7* as "x", go to the *Display Configuration Group x Table*.

The electrical interfaces (pin-outs) for the *Display Configuration Group* in are shown in the *Display Configuration Group x Table* and are used to generate the installation wiring diagrams.

Using the *Display Input Control Group* number from *ICD Table 5.2.7* as "x", go to the *Display Input Control Group x Table*. The *Display Input Control Group* will show what ARINC 429 buses have to be connected for the selected display.

NOTE: Even if you only have one source of Range data you must still connect both ARINC 429 input buses (parallel Bus #1 to Bus #2) if two are shown for the *Display Input Control Group* selected. Not supplying both buses will cause an External Fault to be displayed on the EGPWS front panel and a bus fault will be annunciated during Self-Test.

EXAMPLE: The aircraft is using a single display. The display ID Type is 22, Collins WXI-711 PPI with auto range and overlay in Lower Left of the screen. The single ARINC 429 range bus input (as defined *Display Input Control Group 2*) must be connected to both J2-C13/C14 and J2-B14/B15.

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The electrical interfaces (pin-outs) for the Display Input Control Group are shown in the *Display Input Control Group x Table* and are used to generate the installation wiring diagrams.

Using the Output 429 Bus Group number from *ICD Table 5.2.7* as “x”, go the *Output 429 Bus Group x Table*.

The electrical interfaces (pin-outs) for the Output 429 Bus Group in the *Output 429 Bus Group x Table* and are used to generate the installation wiring diagrams.

NOTE: Section 5.2.6: Use of Internal Mag Var table to True Heading (prior to TDB 425)

If the aircraft installation is using Magnetic Heading and the internal EGPWS Mag Var table to create True Heading (e.g., there is no other source of True Heading for the EGPWS), then the EGPWS Terrain Display will become unavailable for operations beyond 70° North and 60° South latitudes and the Terrain Display and will be deselected 4 seconds after the aircraft exceeds these latitude limits (Terrain Displayable #1/#2 discretes will also be turned off). The EGPWS Terrain/Obstacle Awareness Alerting and Terrain Clearance Floor alerting functions will remain active.

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3.9 Category 8 – Altitude Callouts

Category 8 uses Program Pins 24 and 8 to select the Altitude Callout menu.

3.9.1 Altitude Callout Menu Selection

The Mode 6 Altitude Callout Menus are listed *ICD Table 5.2.8* and define the available altitude awareness callout and voice (male or female) combinations.

The “Approaching Minimums” or “Approaching Decision Height” callout is issued on descent below Decision Height plus 80 or 100 feet respectively. The “Approaching Minimums”, “Approaching Decision Height”, “xxx Above” and “Plus xxx” callouts require the ARINC 429 Decision Height input. Refer to the definition of the selected Category 2 ID to determine if this input is available. If the ARINC 429 DH is not supported, selecting a menu containing an “Approaching Minimums”-type callout will result in error messages and no Mode 6 callouts.

The “Minimums”, “Decision Height” or “Decide” callout is issued when the aircraft descends below the Decision Height setting.

As an alternative to the predefined callout menus, a “Minimums” only callout is possible.

An optional Smart “500” foot callout is available via Category 11.

NOTE: The TAWS Advisory Circular AC 25.23 Requires a “500” FOOT Callout. This callout can be either a normal or Smart “500” callout. Also required in TSO C151b,

Recommendation: Honeywell recommends at least a callout at 500’ and a “Minimums”-type callout.

3.9.2 Instructions

Using <i>ICD Table 5.2.8</i> , select the preferred Altitude Callout Menu Type (ID).
Record the Altitude Callout Menu Type (ID) number from <i>ICD Table 5.2.8</i> under the Ident No. heading for Step (Category) 8 in <i>ICD Table 5.1</i> .
Record the PP 8 and PP 24 States from <i>ICD Table 5.2.8</i> under appropriate PROG. PIN/STATE headings for Step (Category) 8 in <i>ICD Table 5.1</i> .
Record the Altitude Callout Menu Type number here → _____.
Does the selected Altitude Callout Menu includes an “Approaching xxx”, “xxx Above” or “Plus xxx” callout? _____. NOTE: If “Yes” then a ARINC 429 Selected DH input must be provided in the selected Category 2 ID.
Does the ARINC 429 selected Altitude Callout Menu includes a “Decision Height” or “Minimums”-type callout? _____. NOTE: If “Yes”, then either Selected DH (Category 2) or the DH Discrete input (Category 14) must be provided.

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3.10 Category 9 – Audio Output Level

Category 9 uses Program Pin 22 to control the volume level for alert menu callouts (cautions and warnings) and provides the ability to modify the Mode 6 volume level (for altitude and bank angle callouts) by –3dB. Refer to Category 11 for information on selecting the Mode 6 volume level.

ICD Table 5.2.9 shows the options for the Alert Volume and for Mode 6 volume modification.

3.10.1 Alert Volume Control

The high, mid, and low volumes for EGPWS callouts to the cockpit speakers and headsets are shown in *ICD Table 5.2.9*. The low volume is 6dB less than the high volume and the mid volume is 3dB less than the high volume. Both the 8 and 600-ohm outputs are always provided.

NOTE: The mid volume level is available for version –206 and on.

	Pins	Signals	Electrical Range	
			“High Volume” is strapped	“Low Volume” is strapped
600-ohm Interphone Output	J1B-14	LO	- output power is 25 mW 14.4 $\pm$2 volts peak-to-peak 50 mW RMS @ 800 Hz	- output power is 4 mW 8.2 $\pm$1 volts peak-to-peak 16 mW RMS @ 800 Hz
	J1B-13	HI		
	J1B-18 J1B-17	LO HI		
	Front panel connector	N/A		
8-ohm Speaker Output	J1A-33	Hi	- output power is 2 W 13.8$\pm$2 volts peak-to-peak 4.4 W RMS @ 800 Hz	- output power is 0.5 W 7.2$\pm$1 volts peak-to-peak 1.1 W RMS @ 800 Hz
	Chassis GND	Low		

NOTE: The 8-ohm speaker output is connected to J1B-14 in many MK VII Classic GPWS installations. When using the EGPWS 8-ohm audio output, the 8-ohm speaker LOW cannot be connected to J1B-14. It must be tied to DC chassis ground, close to the speaker.

3.10.2 Alternate Mode 6 Volume Control

Using Category 11, the Mode 6 (altitude) volume can either be set to the same volume as the Alert volume or to the Alert volume –6dB. For versions –206 and on, Category 9 allows the mode 6 volume to be reduced –3dB from the volume selected in Category 11.

NOTE: A Mode 6 Low Volume Discrete input is also available to further modify the Mode 6 volume. Refer to Section 3.12 for more information on the Mode 6 Volume Control discrete input.

3.10.3 Instructions

Review the sections above for information on the alert and Mode 6 volume controls.
Review Section 3.12.1 to determine if the –3dB Mode 6 volume adjustment (Alternate Mode 6 Volume = On) will be used.
Using <i>ICD Table 5.2.9</i> , select the preferred Altitude Callout Menu Type (ID).
Record the Altitude Callout Menu Type (ID) number from <i>ICD Table 5.2.9</i> under the Ident No. heading for Step (Category) 9 in <i>ICD Table 5.1</i> .
Record the PP 22 State from <i>ICD Table 5.2.9</i> under appropriate PROG. PIN/STATE headings for Step (Category) 9 in <i>ICD Table 5.1</i> .

3.11 Category 10 – Options Select Group #1

Category 10 uses Program Pin 10 to control Obstacle Awareness enabling, terrain display Pop Up behavior and Flap Reversal selection. The options are shown in *ICD Table 5.2.10*.

3.11.1 Obstacle Awareness

Obstacle Awareness is available for versions –204 and on.

The Obstacle Awareness feature adds a database of (man-made) obstacles that are greater than 100 feet taller than the surrounding terrain to the Terrain Awareness Alerting calculations. (The Terrain Awareness Alerting feature continuously computes terrain clearance envelopes ahead of the aircraft and issues alerts if the boundaries of these envelopes conflict with terrain elevation data in the terrain database.) Obstacle data is currently only available for North America, Europe and parts of the Caribbean. Not all obstacles will be contained in the database.

NOTE: TA&D and TCF must be enabled if Obstacle Awareness is enabled.

3.11.2 TA&D Alternate Pop-Up Selection

The Terrain Display Select (Category 7) defines default and alternate definitions for EGPWS alert “Pop-up” behavior when no terrain displays are active or when a combination of terrain and non-terrain displays are active. (Some Aircraft Types do not support an Alternate Pop-up definition.)

Pop-Up and Alternate Pop-Up	Defines whether EGPWC visual alerts will “pop-up” on displays not currently displaying terrain data. The entries are:
Yes	Selected terrain-compatible displays will switch to display surrounding terrain data.
Contained	Selected terrain-compatible displays will switch to display terrain data only when no terrain display is active.
No	EGPWS alerts will not pop-up in terrain-compatible displays.
N/A	Not applicable to the Aircraft Type.
Controlled by display	Pop-up behavior is defined by the display strapping. Refer to the display manufacturer for more information.

3.11.3 Flap Reversal Select

The Flap discrete input is defined in Category 14 (Input/Output Discrete Functional Mapping). The Category 10 control is used to reverse the defined logic to match aircraft wiring, if necessary. The Flap Reversal enables the computer to accept Flap Discrete Signal that are active in either the up position or down position.

NOTE: See Section 6, regarding when to use “Flap Reversal”.

+ 28 VDC landing flap discrete activity levels:

	Flap Reversal Program Pin	
	False	True
Flap Signal = +28 VDC	Flap Up	Flap Down
Flap Signal = Inactive	Flap Down	Flap Up

Ground seeking Landing Flap discrete activity levels:

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	Flap Reversal Program Pin	
	False	True
Flap Signal = Ground	Flap Up	Flap Down
Flap Signal = Inactive	Flap Down	Flap Up

3.11.4 Instructions

Review the sections above for information on Obstacle Awareness, Terrain Display Alternate Pop Up behavior and Flap Reversal.

Using *ICD Table 5.2.10*, select the preferred Category 10 (Options Select Group #1) ID.

Record the Category 10 (Options Select Group #1) ID number from *ICD Table 5.2.10* under the Ident No. heading for Step (Category) 10 in *ICD Table 5.1*.

Record the PP 10 State from *ICD Table 5.2.10* under appropriate PROG. PIN/STATE headings for Step (Category) 10 in *ICD Table 5.1*.

3.12 Category 11 – Options Select Group #2

Category 11 uses Program Pin 12 to control the base Mode 6 volume level, Smart 500' callout enabling and Bank Angle callout enabling.

3.12.1 Mode 6 Volume

The Mode 6 volume level selected via Category 11 can be modified by Category 9 (Alternate Mode 6 Volume) and/or by the Mode 6 Low Volume discrete input.

Category 11 controls the volume for Mode 6 callouts (altitude and bank angle) except for the –3dB adjustment available via Category 9 and the –6dB adjustment available via the Mode 6 Low Volume discrete input. If the Mode 6 Volume reduction is “False”, the Mode 6 volume defaults to the alert callout volume selected in Category 9. If the Mode 6 Volume reduction is “True”, the Mode 6 volume defaults to 6dB less than the selected alert volume. (Refer to Section 3.10 (Category 9) for information on the Alert Volume level).

The Mode 6 volume can be either temporarily or permanently reduced another 6dB (below its default volume) using the Mode 6 Volume Control discrete input (Section 3.15). Many installations use the windshield wiper control to reduce the volume when the wipers are off and restore it to its default level when the wipers are on (and cabin noise increases).

For version –206 and on: An additional control is available via Category 9 to permanently reduce the Mode 6 volume to a mid 3dB. This control may be used separately or in conjunction with the –6dB control described in Category 11 & Category 14.

3.12.2 Smart 500' Altitude Callout

A Smart 500 foot callout is available that will issue a “500” foot callout when the aircraft is 500' AGL. This callout is active only during non-precision approaches or when the Glideslope or Localizer deviation is greater than 2 dots.

Recommendation: Honeywell recommends the use of the Smart 500 callout if the selected menu does NOT contain a 500' callout or if all callouts in the selected menu are below 500'. Honeywell recommends at least a callout at 500' and a Minimums -type callout.

NOTE: The TAWS Advisory Circular AC 25-23 requires a Minimum of a Smart “500” foot Callout. This callout can be either a normal or Smart “500” foot Callout.

3.12.3 Bank Angle Callout Enabling

The Bank Angle callouts can be enabled or disabled as appropriate for this installation.

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3.12.4 Instructions

Review the sections above for information on Mode 6 Volume, the smart callout and bank angle callouts.

NOTE: The Mode 6 Volume is also affected by the selection made in Category 9.

Using *ICD Table 5.2.11*, select the preferred Category 11 (Options Select Group #2) ID.

Record the Category 11 (Options Select Group #2) ID number from *ICD Table 5.2.11* under the Ident No. heading for Step (Category) 11 in *ICD Table 5.1*.

Record the PP 12 State from *ICD Table 5.2.11* under appropriate PROG. PIN/STATE headings for Step (Category) 11 in *ICD Table 5.1*.

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3.13 Category 12 – Options Select Group #3

Category 12 uses Program Pin 11 to control Windshear caution voice, GPS input data format and Audio Declutter enabling. *ICD Table 5.2.12* shows the options available.

3.13.1 Windshear Caution Voice

The windshear detection and annunciation feature provides a Windshear Caution and/or Windshear Warning during a windshear event.

The Aircraft Type defines Windshear detection and annunciation activation. If the Aircraft Type activates the Windshear function, it can be modified via Program Pin. If the Aircraft Type disables Windshear, it cannot be enabled.

If windshear detection and annunciation is enabled, the default functionality provides both aural and visual Windshear Warnings and only visual Windshear Cautions! This can be modified to add an audio output to the visual Windshear Cautions (Windshear Caution with Voice). The voice alert will be "Caution, Windshear".

NOTE: If the aircraft has a Predictive Windshear system and a Reactive Windshear system (EGPWS), the Reactive Windshear Caution function must be disabled per FAA requirements. Also note, Label 274 bit 18 (Windshear Caution active/inactive state) in the EGPWS ARINC 429 output data is still active even with the Windshear Caution Voice function disabled. (This may not be installation compatible with some EFIS Displays capable of displaying a Windshear Caution annunciation based on Label 274 bit 18).

REF: *Interim Certification Requirement, Version 10.2, Jan 1995.*

3.13.2 ARINC 743 GPS Select

Added in version –206, this option provides the ability to specify the GPS input data format as ARINC 743 instead of the default ARINC 743A data format. Modifies the format of the GPS in position data selected Category 6.

ARINC 743A

ARINC	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
743A	VFOM	6.1.6.35	136	18	32768ft	Basic	0.125	1000
DATA	HFOM	6.1.6.11	247	18	16 nm	Basic	0.000061035	1000

If the ARINC 743 GPS Select Program Pin Option is selected in Category 12 (refer to section 5.2.12) then VFOM and HFOM will be expected in the following format on this channel.

ARINC	Data	Reference	Label	Sig. Bits	Range	Signal Type	Resolution	Rate (ms)
743	VFOM	6.1.6.35.1	136	15	1024 meters	Basic	0.03125	1000
DATA	HFOM	6.1.6.11.1	247	15	1024 meters	Basic	0.03125	1000

3.13.3 Audio Declutter Disable

Audio Declutter prevents excessive aural alerts by preventing an alert from being constantly repeated while the condition remains true. Entry into an EGPWS alert envelope generates the appropriate EGPWS lamp and aural message. If the situation worsens by a pre-determined amount, the alert will be repeated. The appropriate EGPWS lamp remains illuminated while the aircraft is in the alert envelope. Refer to the *Product Specification for the Enhanced Ground Proximity Warning System Section 6.2* for more information.

Recommendation: Honeywell recommends the use of the Audio Declutter feature.

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NOTE: For version –206 and on, if Audio Declutter is disabled the default Basic GPWS volume must be used and the –3dB Mode 6 volume reduction is not available.

3.13.4 Instructions

Review the sections above for information on Windshear Caution, ARINC 743 and Audio Declutter.
--

Using <i>ICD Table 5.2.12</i> , select the preferred Category 12 (Options Select Group #3) ID.
--

Record the Category 12 (Options Select Group #3) ID number from <i>ICD Table 5.2.12</i> under the Ident No. heading for Step (Category) 12 in <i>ICD Table 5.1</i> .
--

Record the PP 11 State from <i>ICD Table 5.2.12</i> under appropriate PROG. PIN/STATE headings for Step (Category) 12 in <i>ICD Table 5.1</i> .

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3.14 Category 13 – Audio Options Select (Audio Menu)

Category 13 uses Program Pin 3 to select the alert callouts issued by the MK VII EGPWS.

3.14.1 Audio Menu Selection

One of seven Basic GPWS (non-altitude) alert menus must be selected to provide Basic GPWS callouts. *ICD Table 5.2.13* summarizes the options. Refer to *ICD Tables 5.2.13-x* for a complete definition of each menu. **DGAC-registered aircraft are required to use Audio Menu #1.**

Recommendation: Honeywell strongly recommends the Basic Audio Menu (except for DGAC-registered aircraft).

3.14.2 Instructions

Review <i>ICD Table 5.2.13-x</i> to determine which Audio Menu is preferred for alert callouts.
Using the Audio Menu Type number from the selected <i>ICD Table 5.2.13-x</i> , determine the corresponding Audio Options Select ID.
Record the Audio Options Select ID number from <i>ICD Table 5.2-13</i> under the Ident No. heading for Step (Category) 13 in <i>ICD Table 5.1</i> .
Record the PP 3 State from <i>ICD Table 5.2.13</i> under appropriate PROG. PIN/STATE headings for Step (Category) 13 in <i>ICD Table 5.1</i> .

3.15 Category 14 – Input/Output Discrete Function Mapping (And Lamp Format)

Category 14 uses Program Pin 4 to control the definitions of those discrete inputs and outputs not defined as part of any of the other Categories.

There are two lamp formats defined as a function of the aircraft type, see Section 4.1.8, Lamp definition.

Lamp Format type 1 configurations, only Mode 5 “Glideslope” message will activate the caution lamp output (amber). All other messages (except Windshear) will activate the warning lamp output (red).

Mode 6 does not activate any lamp outputs, only voices.

Lamp Format type 2, only the messages containing the phrase “Pull Up” will activate the warning lamp output (red). All other messages (except Windshear) will activate the caution lamp output (amber).

The Glideslope Cancel Discrete controls the output of the Mode 5 “Glideslope” message. If the Glideslope Cancel Discrete is activated then the caution lamp (amber) and the voice annunciation will be inhibited for the Mode 5 “Glideslope” message.

3.15.1 Input/Output Discretes

ICD Table 5.2.14 summarizes the Input/Output discretes and Lamp Format options and availability. The discrete inputs are defined in *ICD Section 6.4*. The discrete outputs are defined in *ICD Section 7.3*. Additional information for some discretes is provided below.

NOTE: When there are two discrete pin choices for the same pin function in *ICD Table 5.2.14-x*, use only the one that matches the aircraft wiring (+28V and 0V or Ground and Open).

Audio Suppress (Inhibit)/All Modes Inhibit Discrete (GND or +28V)

The Audio Inhibit discrete is an optional input but is strongly recommended to maintain audio and visual prioritization. If Non-Windshear EGPWS Suppression is disabled, the Audio Inhibit discrete is not required; otherwise it is required.

The function of this discrete is controlled by the Category 5 selection. When activated, this discrete always inhibits all audio except for the windshear warning. If configured via the Category 5 selection to suppress the visual outputs in addition to the audio outputs, activation of this discrete will suppress all visual and audio outputs except for windshear warning.

Activation of the Audio Inhibit input for more than 60 seconds will result in the “All Modes Inhibit” fault which will cause GPW and Terrain INOP indications (described in *ICD Section 6.4.18 & 6.4.19*), when either of the following conditions are true:

- audio and visual EGPWS suppression is enabled, or
- the Aircraft Type enables Audio Inhibit Monitoring (refer to the selected Category 1 definition in the ICD). The Audio Inhibit discrete input can be connected to any or all of the following (as applicable to the Aircraft Type):

The Audio Inhibit Discrete Input can be connected to any or all of the following:

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- the Stall Warning computers (this is required for CAA-registered aircraft)
- the PWS Audio Inhibit output discrete if Hazard bus label 077 is used (To determine which Hazard bus label is used, refer to the *Interface Control Document* for the Hazard bus definitions for the selected Aircraft Type).
- a separately labeled guarded cockpit switch
- a reactive Windshear system if separate from the EGPWS.

NOTE: For some existing GPWS installations, this discrete may have been tied to the analog Radio Altimeter Receiver-Transmitter Self-Test output. This connection is no longer required but may be left intact for this installation.

Altitude Callouts Enable Discrete

The Altitude Callouts Enable discrete is used to enable the altitude callouts. This discrete must be enabled if an Altitude Callout Menu has been selected in Category 8.

This discrete must be connected to ground to enable the altitude callouts. (The "Minimums" callout will be provided if this discrete is disabled and the Decision Height discrete is provided.)

Glideslope Cancel Discrete

The Glideslope Cancel discrete provides the crew with the capability to manually cancel Mode 5 for an approach. This is automatically reset when the aircraft descends below 30 feet or ascends above 2000 feet or 1000 feet as defined in the Appendix A Aircraft Type Aircraft Description.

This discrete is typically supplied by a momentary action cockpit Glideslope mode manual inhibit switch.

Mode 6 Low Volume Discrete

The Mode 6 Low Volume discrete permanently or temporarily modifies the volume of the Mode 6 altitude and bank angle callouts. This discrete operates independent of the Category 9 and Category 11 Mode 6 Volume options.

The Mode 6 Low Volume discrete is used to set the Mode 6 volume to 6dB less than the Category 9 and Category 11 selections. (The effect of the volume reductions is cumulative.)

This discrete is typically connected to ground to lower the volume an additional 6dB. In some installations, it is connected to the windshield wiper control to decrease the Mode 6 Volume level under normal conditions and increase it 6dB when the cabin noise increases due to the windshield wipers being on.

Steep Approach Discretes #1 and #2

The Category 14 selection determines whether Steep Approach is available for the installation. To activate Steep Approach, both of the Steep Approach discretes must be selected.

To use Steep Approach, discrete #1 must be enabled (it can be hardwired); discrete #2 is selected in flight when starting a steep approach typically via an alternate action switch or latching discrete. Steep Approach discrete #2 should not be hardwired. ***On ground self-test is inhibited if Steep Approach is active.***

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This feature desensitizes the Mode 1 (Excessive Descent Rate) alert boundaries to permit safe but steeper than normal instrument precision approaches (e.g. MLS or GPS approaches) without unwanted alerts.

The Category 14 selection determines if Steep Approach is available for the installation by defining whether or not the Steep Approach discrete inputs are defined.

Terrain Awareness and TCF Inhibit

The Terrain Awareness and TCF Inhibit discrete indicates to the MK VII EGPWS whether these functions are inhibited or not inhibited. **This discrete is required for all installations, that enable TAD & TCF In category 7.**

This discrete is typically connected to an “alternate action switch” in the cockpit. The recommended label for this switch is “Terrain Override” although labeling for this switch should be consistent with existing cockpit nomenclature.

“Terrain Inhibited” will be annunciated during cockpit Self-Test if these functions are inhibited.

Fault monitoring: For some installations, activation of this input for more than 5 seconds will activate the Terrain Monitor (refer to the *ICD 5.2.7*, “Terrain Display Configuration Data table for each aircraft type”). The functionality of this input is not affected by the ‘EGPWS Suppress’ Program Pin 10 option (PPCNF10).

3.15.2 Lamp Format

The Lamp Format Type (configuration) is a function of the discrete output pin functions and defines the operation of the red and amber GPWS cockpit lamps. Two lamp format types have been defined.

If the Lamp Format is Type 1, an amber “Below G/S” lamp is driven by the GPWS Alert discrete and a red “GPWS” or “Pull-Up” lamp is driven by the remaining non-windshear alerts.

If the Lamp Format is Type 2, an amber “GPWS” or “GND Prox” lamp is driven by the non-windshear alerts and a red “Pull-Up” lamp is driven by the non-windshear warnings. The warnings generate “Pull-up” audio messages.

NOTE: Lamps flash only if Flashing Lamps was selected in Category 4.

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3.15.3 Instructions

Using *ICD Table 5.2.14*, select the Input/Output Discrete Type number that matches the aircraft configuration, feature preferences and version (part number) being installed.

Record the Input/Output Discrete Type number from *ICD Table 5.2.14* under the Ident No. heading for Step (Category) 14 in *ICD Table 5.1*.

Record the PP 4 States from *ICD Table 5.2.14* under appropriate PROG. PIN/STATE headings for Step (Category) 14 in *ICD Table 5.1*.

Using the Input/Output Discrete Type number from *ICD Table 5.2.14* as “x”, go the *ICD Table 5.2.14-x*.

The electrical interfaces for the Input/Output Discrete Type are shown in *ICD Table 5.2.14-x* and are used to generate the installation wiring diagrams.

NOTE: When there are two discrete pin choices for the same pin function in *ICD Table 5.2.14-x*, use only the one that matches the aircraft wiring (use only the +28V and 0V or the Ground and Open definitions).

NOTE: Category 15 – Parity Select is covered in Section 3.18.

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3.16 Category 16 – Optional Input Selection

Category 16 uses Program Pin 7 to enable the ARINC 429 input(s) from Predictive Windshear System(s).

3.16.1 Predictive Windshear Input

ICD Table 5.2.16 summarizes the options and identifies the first MK VII EGPWS version in which the option was available.

ICD Tables 5.2.16-x, where x is the Optional Input Select ID from *ICD Table 5.2.16*, define the interfaces.

3.16.2 Instructions

Determine whether single, dual or no PWS inputs will be provided to the MK VII EGPWS.
If PWS inputs will be provided, determine which of the ARINC 429 channels in <i>ICD Tables 5.2.16-x</i> are available for PWS inputs. NOTE: Dual PWS inputs may be provided on a single channel as described in <i>ICD Table 5.2.16 Note 1</i> .
Using <i>ICD Table 5.2.16</i> , select the Optional Input Select ID number that matches the PWS inputs, channel availability and version (part number) being installed.
Record the Optional Input Select ID number from <i>ICD Table 5.2.16</i> under the Ident No. heading for Step (Category) 16 in <i>ICD Table 5.1</i> .
Record the PP 7 States from <i>ICD Table 5.2.16</i> under appropriate PROG. PIN/STATE headings for Step (Category) 16 in <i>ICD Table 5.1</i> .
Using the Optional Input Select ID number from <i>ICD Table 5.2.16</i> as “x”, go the <i>ICD Table 5.2.16-x</i> .
The electrical interfaces (pin-outs) for the Optional Input Select ID number are shown in <i>ICD Table 5.2.16-x</i> and are used to generate the installation wiring diagrams.

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3.17 Category 17 – Options Select Group # 4

Category 17 uses Program Pin 23 to control Peaks Display Mode enabling (version –208 and on) and GPS Reference Altitude selection (version –208 and on). *ICD Table 5.2.17* shows the options and identifies the first MK VII EGPWS version in which each option was available.

3.17.1 Peaks Mode

Available beginning with version –208, Peaks mode is an alternate means of displaying terrain data. The standard terrain display mode displays terrain relative to the aircraft altitude that is within the aircraft envelope (the terrain is above or not more than 2000 feet below the aircraft). The terrain display is typically blank during the cruise portion of a flight. Peaks Display mode provides increased situational awareness by providing the same information as the standard mode as well as displaying terrain outside of the aircraft envelope. Peaks Display mode displays terrain based on the absolute terrain elevations.

NOTE: TAD and TCF must be enabled if Peaks mode is enabled. The Display Configuration Group (Category 7) defines Peaks Mode availability by defining the effects of enabling and disabling the Peaks Mode enable. Refer to Section 3.8.5 for the selected Display Configuration Group.

3.17.2 GPS Altitude Reference

Prior to version -208, the GPS Altitude (label 076) must be referenced to mean sea level. Beginning with version –208, the GPS Altitude may be referenced to either mean sea level or WGS-84.

3.17.3 Add 500 Callout

Beginning with version -214, the 'Add 500 Callout' option enables selection of altitude callout menus 100 to 199. This option allows the installer to add a 500 foot callout to any of the defined menus 0 through 99. If 500 foot is already present in the selected basic menu then this option should not be selected.

3.17.4 Instructions

Determine the GPS Altitude Reference and Peaks Mode enabling for this installation.
Using <i>ICD Table 5.2.17</i> , select the Options Select Group #4 ID number that matches the feature preferences.
Record the Options Select Group #4 ID number from <i>ICD Table 5.2.17</i> under the Ident No. heading for Step (Category) 17 in <i>ICD Table 5.1</i> .
Record the PP 23 States from <i>ICD Table 5.2.17</i> under appropriate PROG. PIN/STATE headings for Step (Category) 17 in <i>ICD Table 5.1</i> .

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3.18 Category 15 – Parity Select

This Category must be completed after all Program Pin strapping has been defined.

Category 15 uses Program Pin 5 to set the Program Pin parity to odd.

The MK VII EGPWS requires “**Odd**” parity for the Program Pins. If the number of connections is even (do **NOT** count “open”), Program Pin 17 must be strapped to PPCOM. If odd, Program Pin 17 must be left open. Refer to *ICD Section 5.1 and Figure 5.1*.

3.18.1 Instructions

This must be the last Program Pin strapping to be defined.
Count all of the Program Pin connections to Program Pin States two through 10 in <i>ICD Figure 5.1</i> . Do not count connections to Program Pin State 1 (Open).
Using <i>ICD Table 5.2.15</i> , select the Parity Select ID number that results in an odd parity. • If the count of Program Pin connections is odd, select ID 0. • If the count of Program Pin connections is even, select ID 1.
Record the Parity Select ID number from <i>ICD Table 5.2.15</i> under the Ident No. heading for Step (Category) 15 in <i>ICD Table 5.1</i> .
Record the PP 5 State from <i>ICD Table 5.2.15</i> under appropriate PROG. PIN/STATE headings for Step (Category) 15 in <i>ICD Table 5.1</i> .

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4.0 Mechanical Installation Design Details

This section is intended to provide guidance in completing the installation design including a typical parts list with vendors, part numbers, and component specifications.

4.1 System Components

A typical MK VII Enhanced Ground Proximity Warning System consists of the components listed below. Supporting installation hardware may also be required.

Description	Qty	Specification Section
Ground Proximity Warning Computer	1	4.1.1
Computer Mounting Tray	1	4.1.2
Biax & Mount	Optional	4.1.3 / 4.1.4
Rear Connectors (upper & lower)	1	4.1.5
Front Panel Test Connector Mate	Optional	4.1.6
Cockpit Lights (light plates)	Installation Dependant	0
Switching Relays		4.1.10
GPS Antenna	Optional	4.1.11
GPS Antenna Cable Contacts	Optional	4.1.12
GPS Cabling	Optional	4.1.13

End Item Part Number	965-1076-001-xxx-xxx	965-1076-020-xxx-xxx	965-1076-030-xxx-xxx	965-1076-040-xxx-xxx	965-1076-060-xxx-xxx
EGPWC Input Power Type	115 VAC 400 Hz	115 VAC 400 Hz	28 VDC	28 VDC	115 VAC 400 Hz
Input Power Requirement					
With No Warning:	23 Watts	28 Watts	28 Watts	24 Watts	35 Watts
With Warning (over 8 Ω speaker):	24 Watts	29 Watts	29 Watts	27 Watts	40 Watts
With Heater Blanket On:	N/A	N/A	N/A	70 Watts (typical) when on	N/A
Powering BIAx and Airspeed Transducer:	add 3.8 Watts	add 3.8 Watts	add 3.8 Watts	add 3.8 Watts	add 3.8 Watts
Recommended EGPWC Power Control Device	2 Amp Delayed Action Circuit Breaker	2 Amp Delayed Action Circuit Breaker	2 Amp Delayed Action Circuit Breaker	5 Amp Delayed Action Circuit Breaker	2 Amp Delayed Action Circuit Breaker

4.1.1 MK VII Enhanced Ground Proximity Warning Computer

The MK VII EGPWC is available in either a 115 VAC input power model or a 28 VDC input power model. The part numbers, front view and outline drawing are shown below. The MK VII EGPWS

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is available with three models of internal GPS. The MK VII EGPWS with internal GPS position may be programmed to use internal or external GPS data.

Item	Qty	Description & Part Numbers				
		115 Volt Computer	115 Volt Computer with pXpress GPS	28 Volt Computer with pXpress GPS	28 Volt Computer	115 Volt Computer with Mercury GNSS
MK VII EGPWC Computer	1	965-1076-001-xxx-xxx	965-1076-020-xxx-xxx	965-1076-030-xxx-xxx	965-1076-040-xxx-xxx	965-1076-060-xxx-xxx

Note: The MK VII EGPWS 16-Digit Part Number, Including Software Part Number, is also Referenced as a 10-Digit "System Number".

965-1076-040-xxx-xxx=960-2224	965-1076-020-xxx-xxx=960-2225
965-1076-001-xxx-xxx=960-2226	965-1076-030-xxx-xxx=960-2230
965-1076-060-xxx-xxx=960-2233	

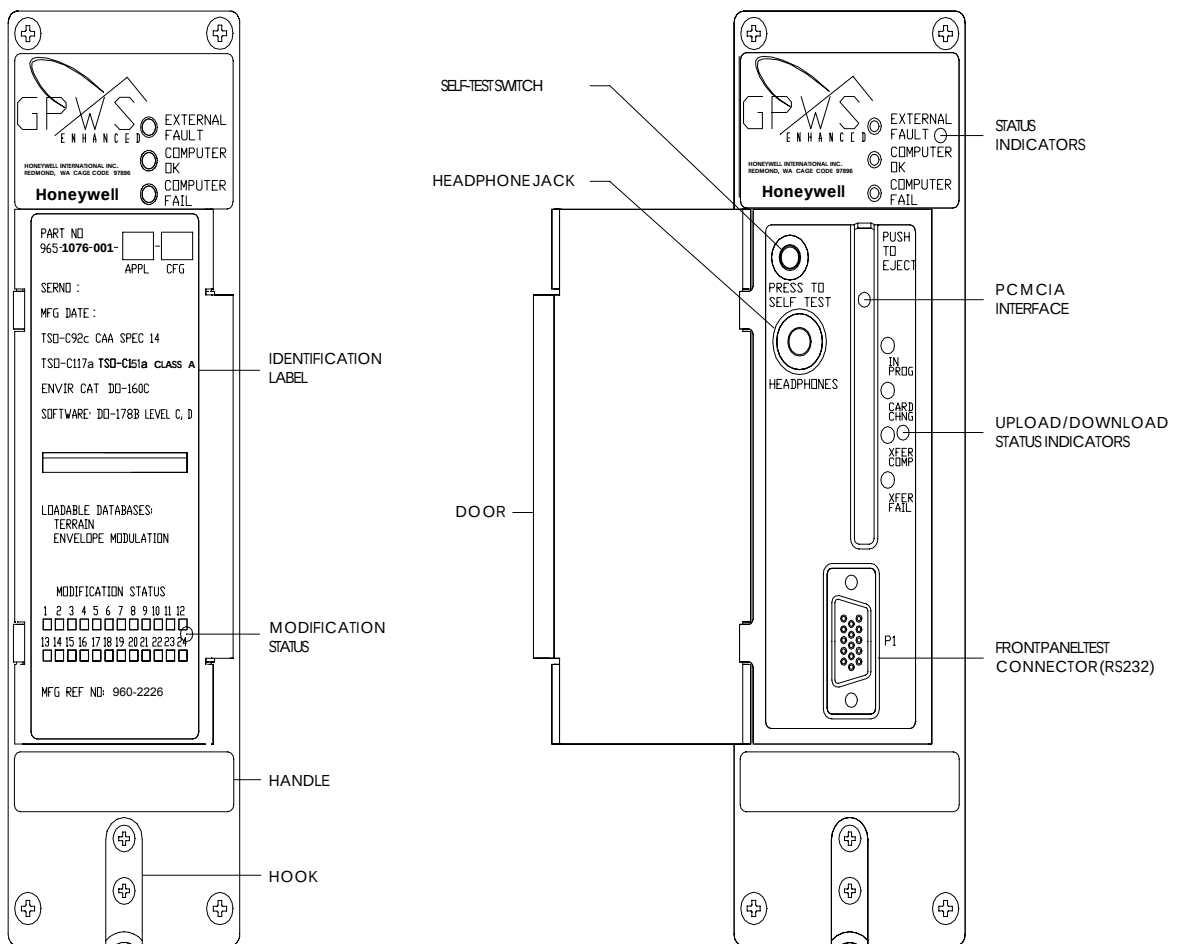
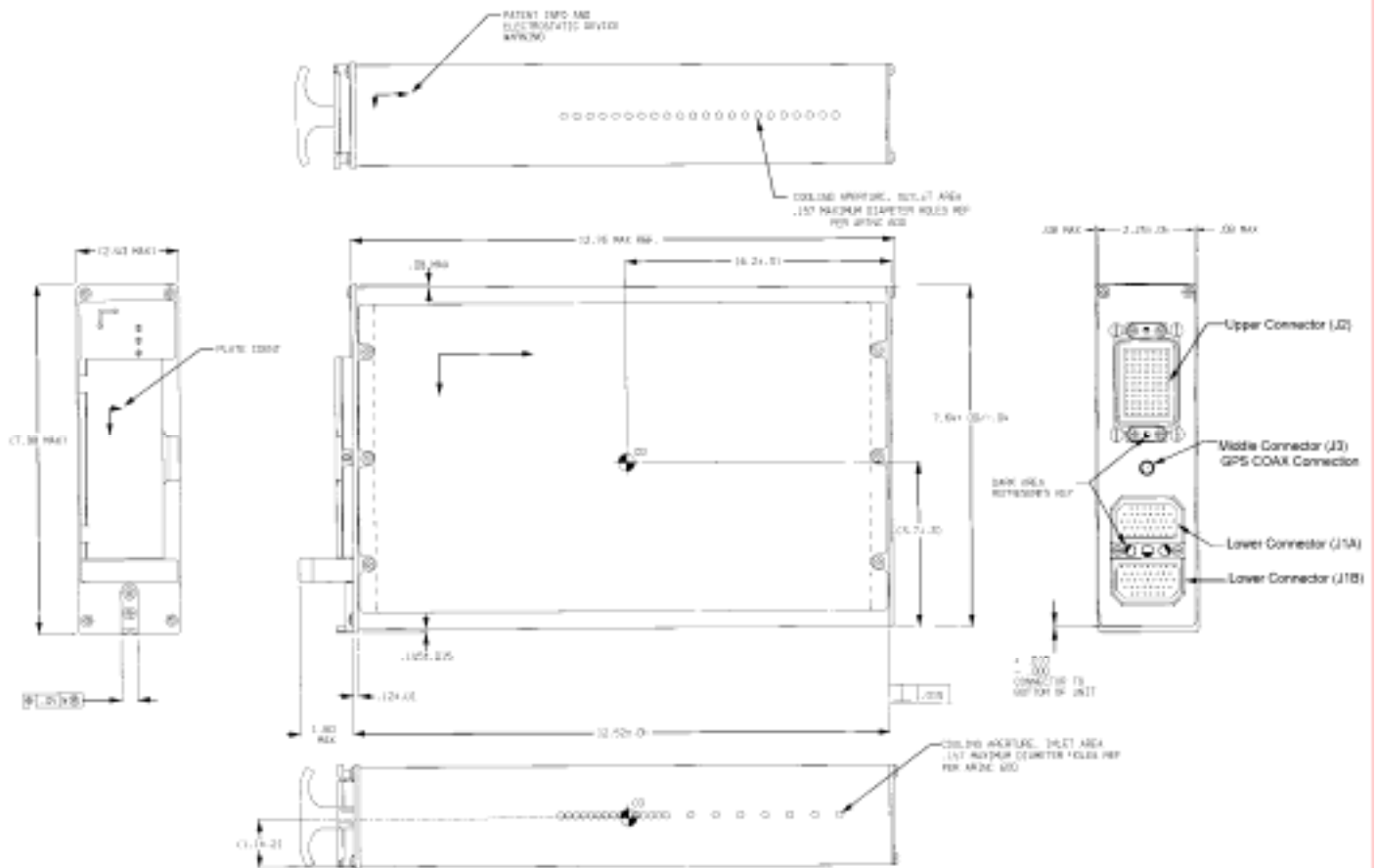


Figure 4.1.1-1 MK VII EGPWC - Front View

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PART No.'s

960-2224-0XX, 960-2225-0XX, 960-2226-0XX, 960-2230-0XX, 960-2233-0XX

EGPWC Electrical & Physical Specifications

Part No: 965-1076-0xx-xxx-xxx
 Packaging: 2 MCU ARINC 600-6
 Weight: 7.0 LB MAX
 Mounting: Per ARINC 600-6 with ARINC 600 and ARINC 404A connectors

Cooling: Per ARINC 600-6 & ARINC 404A convection cooling
 Power: • 23-35 Watts, Non-Warning
 Consumption: • 24-40 Watts, With Warning (over 8Ω speaker)

Figure 4.1.1-2 MK VII Enhanced Ground Proximity Warning Computer Outline

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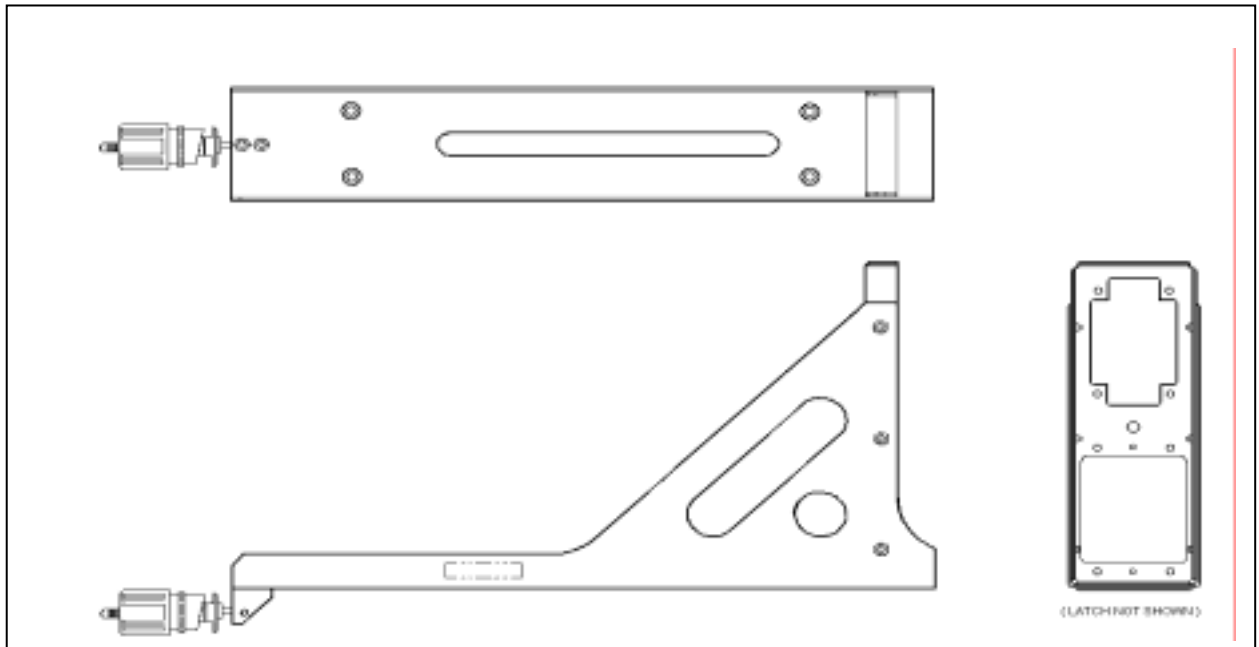
4.1.2 Mounting Tray (ARINC 600, 2 MCU)

Item	Qty	Vendor & Part No.			
		Honeywell	Barry Control	Hollingsead International	Electrical & Mechanical Technologies (EMTEQ)
Recommended Trays					
Short Tray for P/N 965-1076-0xx with internal GPS (Improved cooling)	1	600-5705-004	-	-	MT4-2014S (¼ ATR S/S, Oval Cutout, TL, GPS Hole)
Long Tray for P/N 965-1076-0xx with internal GPS (Improved cooling)	1	600-5705-006	-	-	MT4-2020S (¼ ATR S/L, Oval Cutout, TL, GPS Hole)
Also Available					
Short Tray – Basic	1	600-5705-001 ¹	-	-	-
		405-0300-002	95344-2	-	-
		405-0300-001	-	10057-101	-
		N/A	-	-	MT4-2005S (1/4 ATR S/S, Flat Bottom, TL Hldns)
Long Tray – Basic	1	600-5705-002 ¹	95344-4	10057-201	MT4-2008S (1/4 ATR S/L, Flat Bottom, TL Hldns)
Long Tray – Basic					MT4-2011S (1/4 ATR S/L, Special Tray, TL Hldns)
Short Tray for P/N 965-1076-0xx with internal GPS	1	600-5705-005	-	-	MT4-2017S (¼ ATR S/S, Flat Bottom, Cutout, TL, GPS Hole)
Long Tray for P/N 965-1076-0xx with internal GPS	1	600-5705-007	-	-	MT4-2023S (1/4 ATR S/T/L, Flat Bottom, TL, GPS Hole)

¹ Can be modified to add internal GPS per document 011-2494, Rev A or Later.

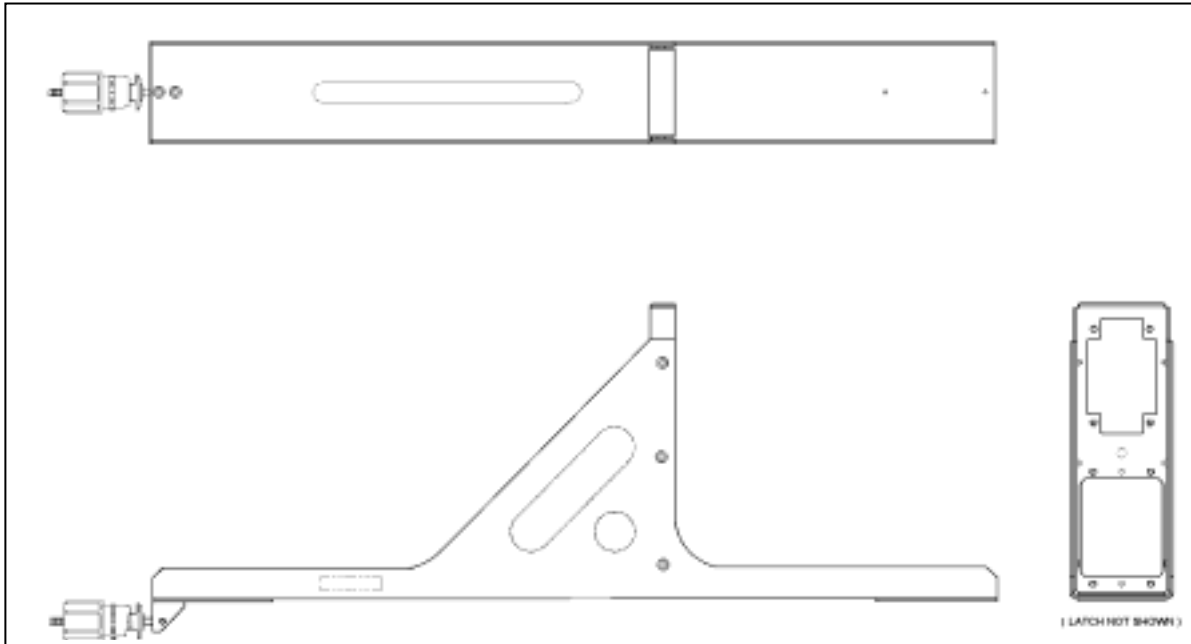
NOTE: The recommended trays with internal GPS can be used with or without internal GPS.

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-004

Figure 4.1.2-1 Short Mounting Tray with Internal GPS & Improved Cooling Outline Drawing



-006

Figure 4.1.2-2 Long Mounting Tray with Internal GPS & Improved Cooling Outline Drawing

13.78

2.38

9.000

2.51

1.500

TRAY

FRONT FACE OF CONNECTOR PLATE

.209 DIA HOLE
CSK 100 DEG x .345 DIA
4 PLACES

12.45

TRAY

MK VII WARNING COMPUTER

A

B

(P1)

CAGE CODE: 97896 SCALE: NONE SIZE: A DWG NO: 060-4199-225 REV: A SHEET 60

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4.1.3 Biaxial Accelerometer

For the EMK VII installation that receive acceleration information from Biaxial Accelerometer, Honeywell PN 979-0223-001, which is automatically tested every time aircraft power is applied to the EMK VII and during every Level 1 self-test performed on the ground.

No local testing can be performed on the Biaxial Accelerometer. If the MK VII indicates the accelerometer is faulty and the interconnect wiring is correct then the Biaxial Accelerometer should be replaced. See section 5, Installation/Ground Check Procedure.

Otherwise, refer to the proper maintenance manual for testing, adjustment, and replacement, if using another source (e.g., IRS, INS).

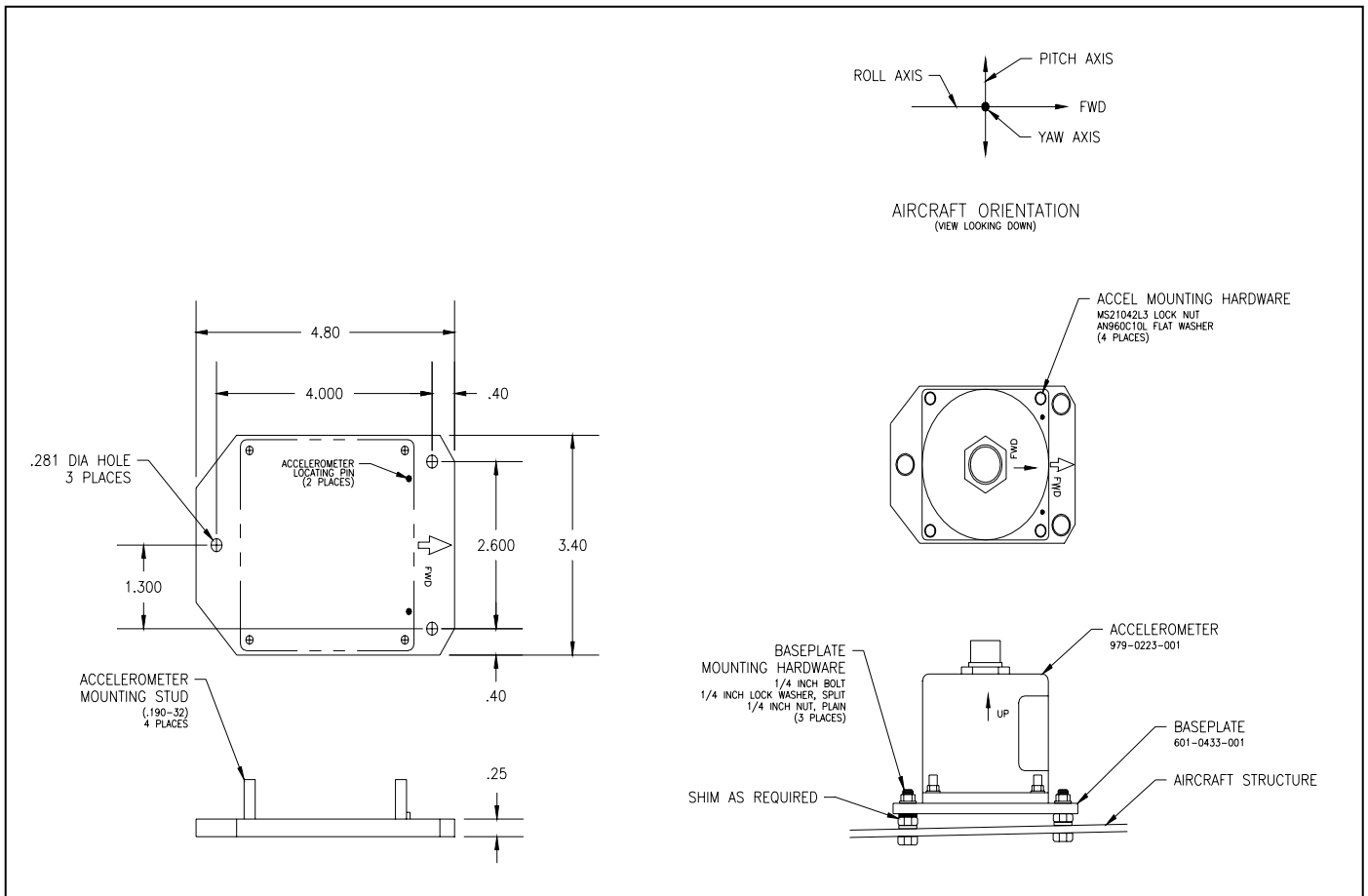


Figure 4.1.3-1 ACCELEROMETER, BASEPLATE & MOUNTING

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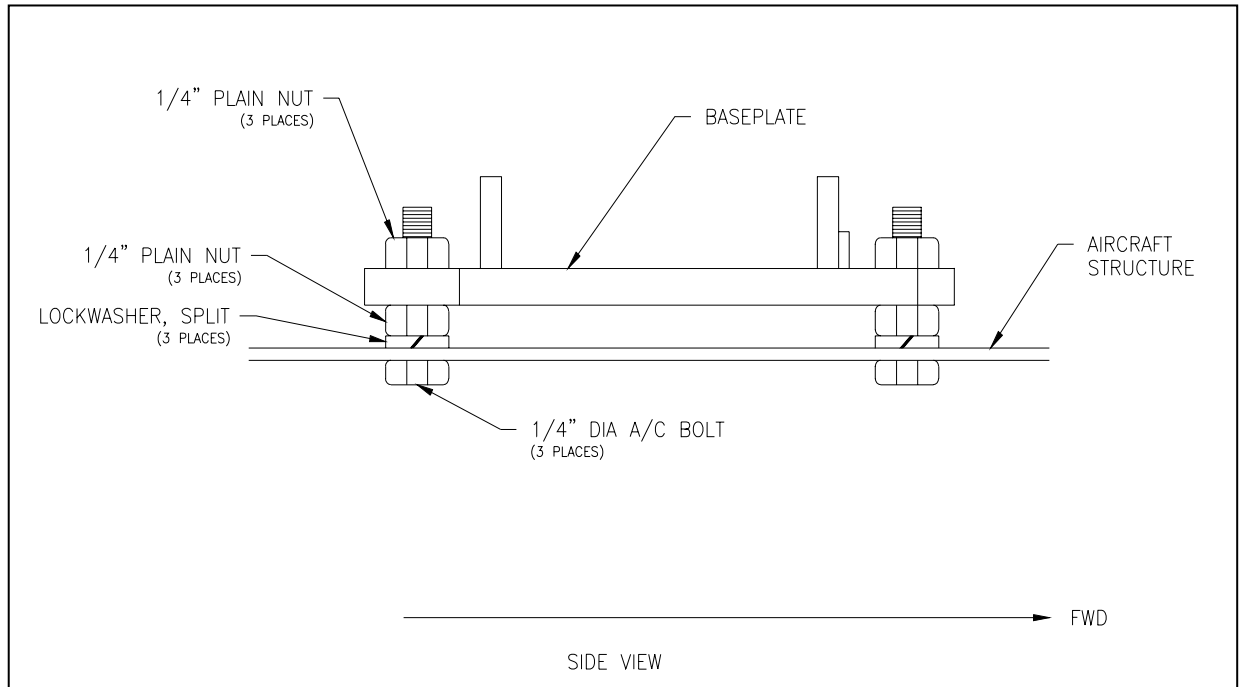


Figure 4.1.3-2 ACCELEROMETER BASEPLATE

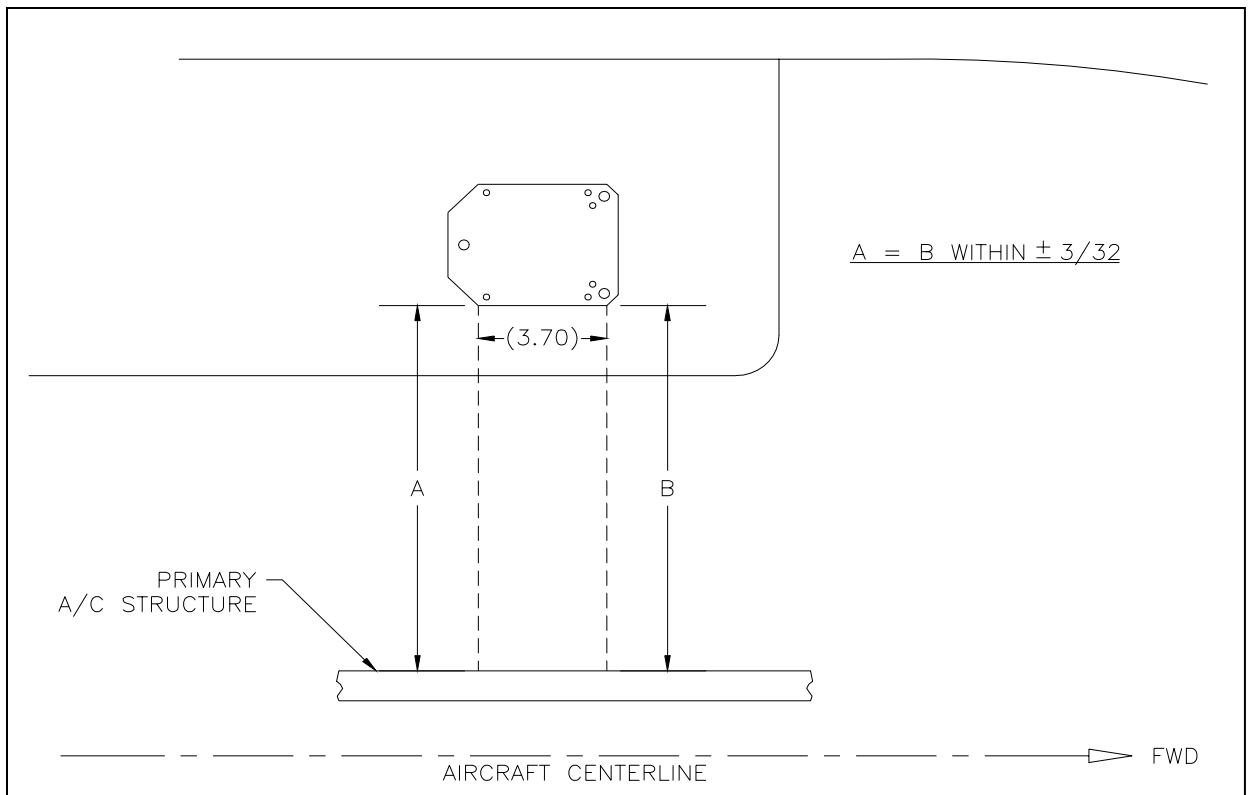


Figure 4.1.3-3 ACCELEROMETER YAW ALIGNMENT CHECK

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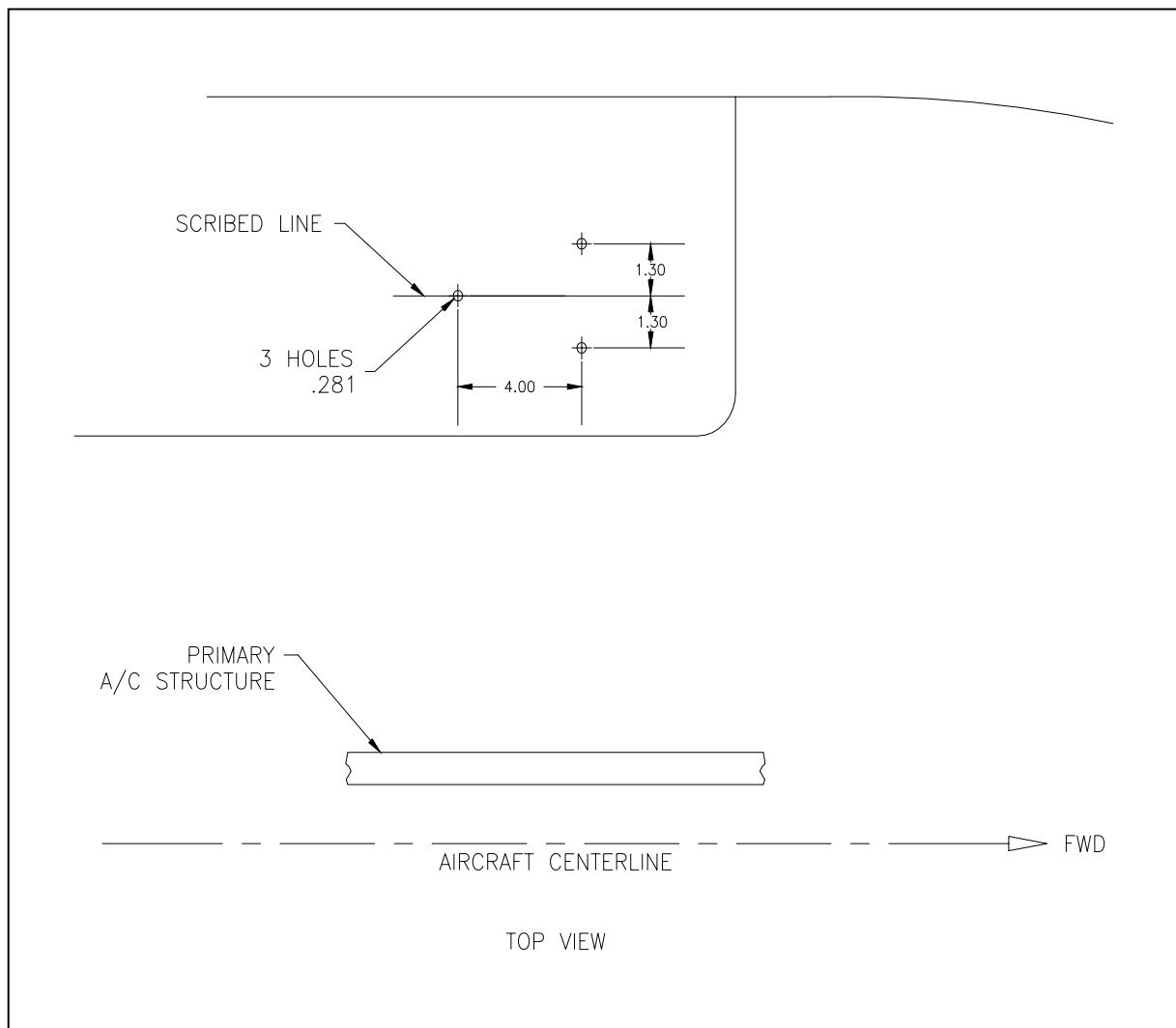


Figure 4.1.3-4 ACCELEROMETER LOCATION OF MOUNTING HOLES

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4.1.4 Biaxial Accelerometer Installation Diagram & Instructions

Accelerometer, Biaxial Part No. 979-0223-001

Baseplate, Accelerometer and Mounting Hardware (Reference Kit Part No. 755-7001-XXX)

ITEM	QTY/DESCRIPTION	HON PN	MIL PN
Baseplate, Assy	1, No 10-32	601-0433-001	---
Nut, Lock	4, No 10	432-0002-014	MS21042L3
Washer, Flat	4, No 1/4	434-0002-029	ANA960C10L
Washer, (0.032)	6, No 1/4	434-0002-030	ANA960C416L
Shim, (0.003)	10, No 1/4	434-0086-002	---
Shim, (0.005)	10, No 1/4	434-0086-003	---

Required Material:

- Standard aircraft quality ¼ inch diameter mounting hardware:
 - Bolts, - 3 required
 - Lockwasher, Split - 3 required
 - Nuts, Plain - 3 required
 - Locknuts – 3 required
 - Cleaning solvent (as required)

A. Mounting

The accelerometer orientation accuracy requirements are as follows:

Pitch and Roll = ± 0.25 Degrees

Yaw = ± 3.00 Degrees

The complete installation relative to its orientation is shown in FIGURE 4.1.3-1.

B. Mounting Structure

The accelerometer and baseplate should be mounted on aircraft structure that minimizes induced vibration. The structure should, at minimum, be .063-inch aluminum sheet and the baseplate located adjacent to features that would provide additional strength and rigidity to the mounting area; for example, bends, dimples, stiffening beads, or flanges. Mounting the baseplate to the structure requires drilling three holes.

NOTE: The accelerometer mounting instructions herein do not cover structural safety or provision of mounting structure for the accelerometer baseplate.

C. Recommended Special Tools:

Portable hand-held electronic protractor (accuracy to be 0.10 degree or better)

Example: (or equivalent) Lucas-Schaeitz Anglestar Digital Protractor Model DP 45

Digi-Key pn 365-1035-ND (Telephone: (800) 545-3243)

<http://www.digikey.com/scripts/dksearch/dksus.dll?Detail?Ref=232116&Row=126668&Site=US>

Measurement Specialties pn 02475-01 (Telephone: (757) 766-1500)

<http://www.meas-spec.com/advizia/v41/ModelDetail.asp?PkgOrder=9&User=PositionTilt&Rnd=65>

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D. Baseplate Installation Instructions

The following steps describe the procedure for installing the baseplate, assuming the location has been selected.

- Step 1** Identify location for baseplate mounting, surface to be horizontal, with accelerometer connector facing up, and the three-hole pattern oriented so the two front holes are facing forward (relative to the aircraft), as indicated by the arrow on the baseplate.
- Step 2** Locate an adjacent known primary vertical longitudinal aircraft structure, typically located near the centerline of the aircraft. From this structure, that becomes the center of the three holes mounting pattern for the baseplate. On this line measure and locate all three mounting holes, see FIGURE 4.1.3-4.
- Step 3** Drill three marked holes to 0.281 inch diameter. Deburr holes and clean area as required.
- Step 4** Place baseplate in position. Install three 1/4" diameter aircraft quality bolts (as shown in FIGURE 4.1.3-2), fastening the baseplate to the aircraft structure. Temporarily install three plain nuts.
- Step 5** Check orientation of the baseplate in the yaw axis. Requirement is to be relative to the longitudinal axis within the tolerance of ± 3 degrees. This is easily checked by measuring the parallelism of the edge of the baseplate to the original aircraft structure. The ± 3 degrees is equal to measuring the distance A equal to distance B within the tolerance of $\pm 3/32$, see FIGURE 4.1.3-3.

NOTE: There is some available adjustment because of the bolt size versus the clearance hole size. Adjust if required.

This completes the initial baseplate installation.

E. Pitch and Roll Alignment

The following describes the method for aligning the accelerometer/baseplate referenced to the pitch and roll axis of the aircraft without setting the aircraft on jacks. The tolerance for this requirement is ± 0.25 degrees.

Objective: Translate relative pitch and roll axis from a known surface to the baseplate using an electronic protractor or equivalent.

- Step 1** Determine known surfaces.

Example A:

Some aircraft have reference surfaces designed into the aircraft structure to provide pitch and roll datums. These surfaces can usually be reached through an access plate (floor panel), and are surfaces sufficient to place a level or similar device for measurement. Do not use a plumb-bob

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system available on some aircraft. Consult the airframe manufacturer's maintenance manual for this information if it is available.

Example B:

Usually the vertical gyro's external frame (flange), or the structure for mounting the inertial navigation computers, has been mounted to reasonable accuracy. Select an acceptable surface.

Step 2 Record angular measurement in both the pitch and roll axis using either of the two examples mentioned in Step 1, using an electronic protractor device or equivalent.

NOTE: Ensure that the protractor is facing the same direction for all measurements.

Step 3 At the accelerometer baseplate, record pitch and roll measurements by placing the measuring device on the baseplate surface.

NOTE: If the pitch and roll readings of the baseplate are within tolerance to the measured referenced surface, proceed to Step 5.

Step 4 Alignment of the baseplate is best achieved by adjusting the baseplate in the roll axis first, since the roll axis has more effect on the pitch axis than the opposite. For example, adjust the two forward fasteners first, then the aft fastener. Loosen the 1/4 inch plain nuts, and add washers and/or shims (0.003 inch and/or 0.005 inch) as required between the baseplate and the bottom plain nut to achieve the same reading as measured in Step 1.

NOTE: The shim/washer thickness buildup affects the adjustment as follows:

Roll sensitivity equals approximately:

.003 shim = .067 degrees

.005 shim = .111 degrees

Pitch sensitivity equals approximately:

.003 shim = .043 degrees

.005 shim = .071 degrees

Step 5 Replace the three 1/4 inch plain nuts with locknuts. Tighten the locknuts at the same three locations while still maintaining the same angular readings.

F. Accelerometer Installation Instructions

Step 1 Orient and position accelerometer to baseplate by aligning location holes in accelerometer plate with the two dowel pins in the baseplate.

Step 2 Secure accelerometer to baseplate using (4) 10-32 locknuts.

Step 3 Recheck original reference structure readings and the accelerometer baseplate readings to ensure the aircraft has not shifted during the adjustment part of the installation.

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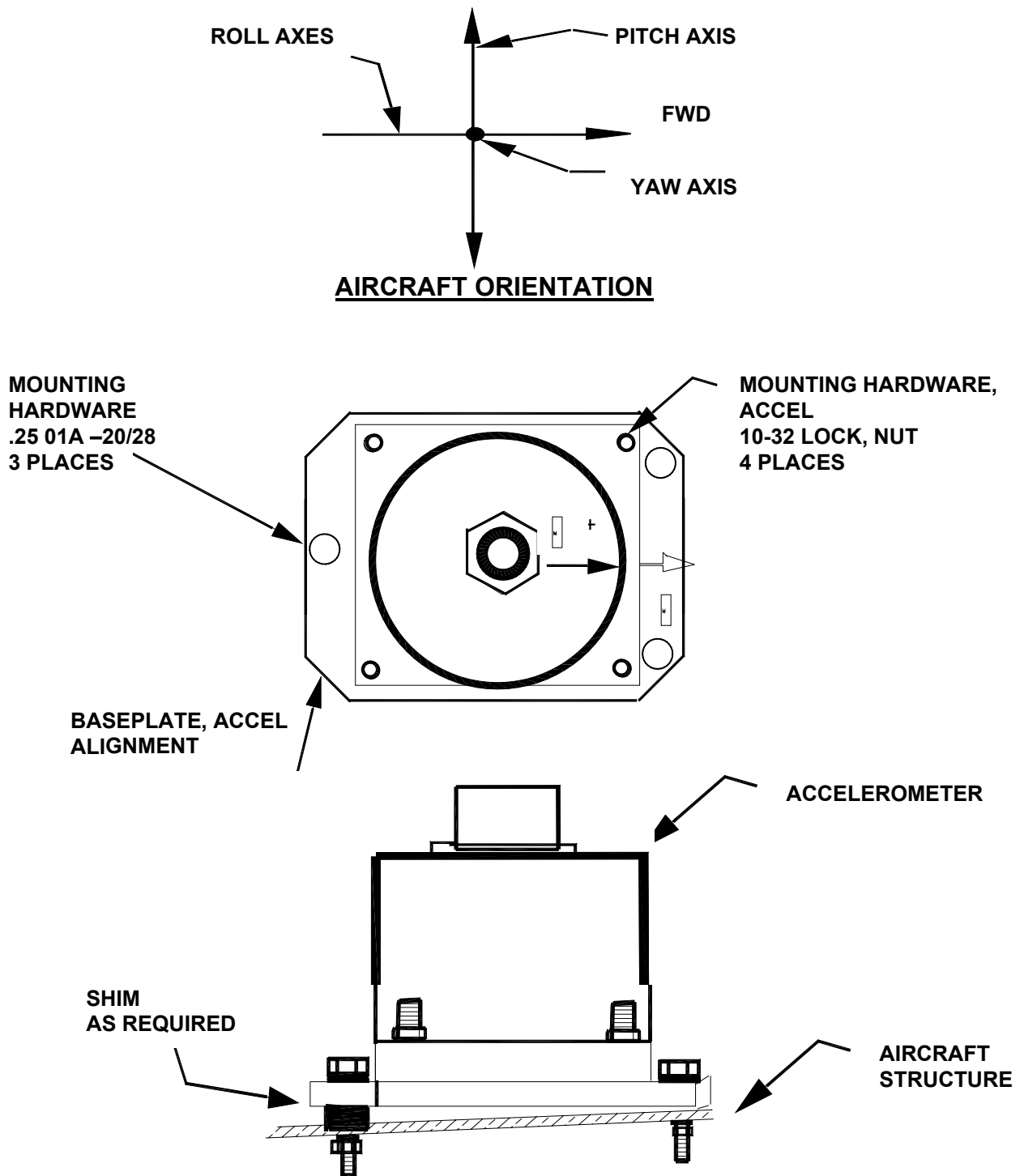


Figure 4.1.4-4 Complete Installation

UNIT: BIAXIAL ACCELEROMETER

CONNECTOR: J1 (Part No. MS3476L12-10S)

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PIN	REF SECT	SIGNAL TYPE	SIGNAL NAME
A		DC Analog	Longitudinal Acceleration out (+)
B			Longitudinal Acceleration out (-)
C		DC Analog	Normal Acceleration Out (+)
D			Normal Acceleration Out (-)
E		Shield	Shield
F		PWR/GND	24VDC Power Input (+)
G			24VDC Power Input (-)
H		Discrete	Accelerometer Self-Test Input
J		Reserved	
K		GND	Chassis Ground
UNIT: BIAxIAL ACCELEROMETER SIGNALS			

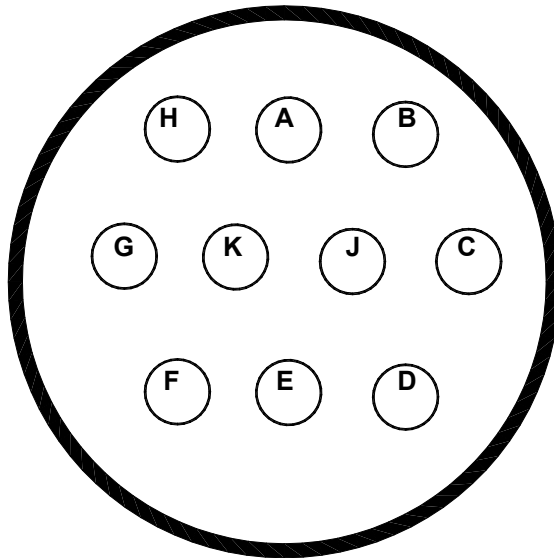


Figure 4.1.4-5 Biax Connector

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4.1.5 MK VII EGPWC Rear Connectors

The main rear connectors of the 965-1076-0xx-xxx-xxx MKVII EGPWC are listed in *ICD Section 8* Figure 8-1 and 8-2. Refer to the appropriate ICD for pinout information. The upper connector is a 150 pin ARINC 600 SGA type. The lower connector is a dual DPX 40 pin ARINC 404 type. In addition, those EGPWC's that have internal GPS cards have a blind mate coax connector for interface to the internal GPS module.

Vendor	Qty	Upper Connector J2 for both 115 VAC and 28 VDC EGPWS		Contacts (Size 2222)
		Without Contacts (pins)	With Contacts (pins)	
Honeywell	1	440-0900-006	440-0900-005	404-4127-004
AMP		-	-	208262-3
Boeing		-	-	BACC47EF1
Framatome		-	-	8660-202
ITT-Cannon		SGA3D150P1510FO	SGA3D150P1510	030-2259-000
Tri-Star		-	-	317-2222-301
Vendor	Qty	Lower Connector J1 for 115 VAC EGPWS (965-1076-001, -020 & -060 only)		Contacts (Size 2020HD)
		With Contacts (sockets)		
Honeywell	1	440-0005-014		-
ITT-Cannon		DPX2MA-40S-40S-33B-0315		060-9134-001
Mil-Spec				M39029/12-149
Tri-Star		-		316-2020-081
Vendor	Qty	Lower Connector J1 for 28 VDC EGPWS (965-1076-030 & -040 only)		Contacts (Size 2020HD)
		Without Contacts (sockets)	With Contacts (sockets)	
Honeywell	1	440-0005-032	440-0005-031	
Mil-Spec		-	-	M39029/12-149
ITT-Cannon		DPX2MA-40S-40S-33B-0388-FO	DPX2MA-40S-40S-33B-0388	060-9134-001
Tri-Star		-	-	316-2020-081
Vendor	Qty	Antenna Connector J3 with I/GPS (965-1076-020, -030 & -060 only)		Only Required when Internal GPS Receiver activated
		No GPS	With Internal GPS	
Huber & Suhner	1	N/A	14BMA50-3-3C (HPN 440-1215-001)	

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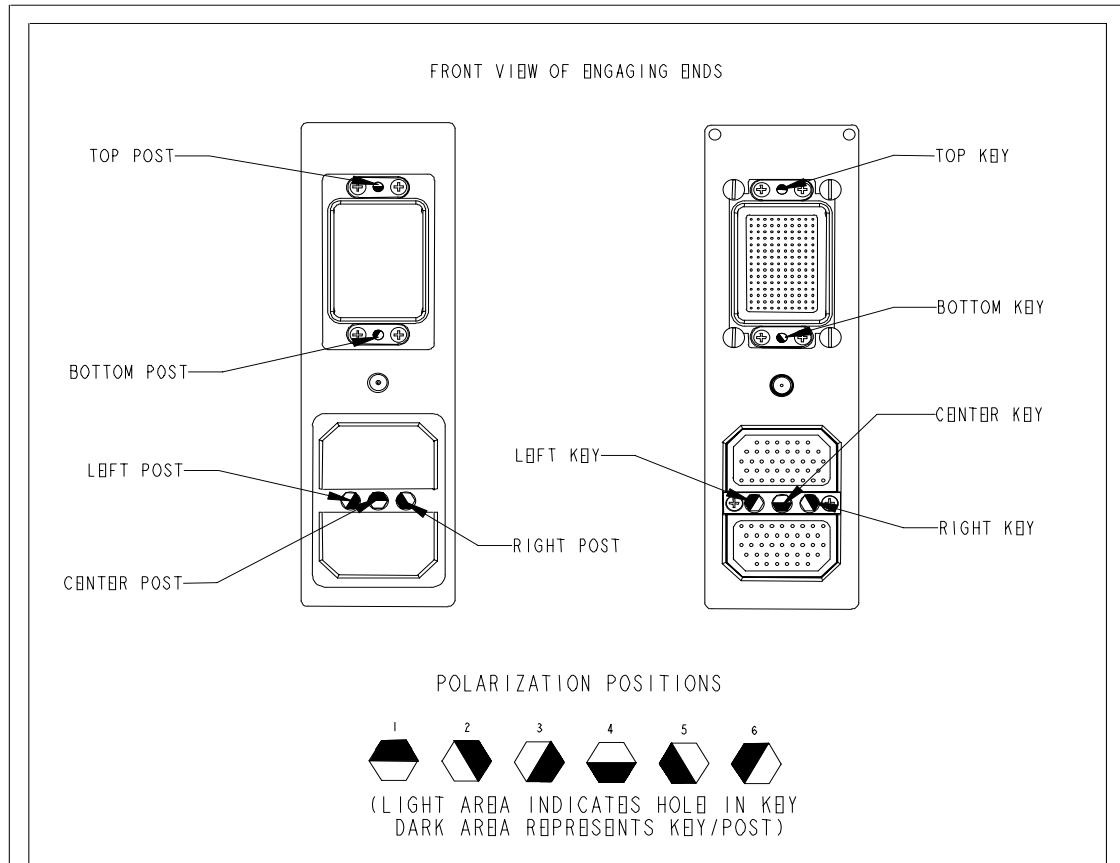


Figure 4.1.5-1 Rear Connect Keying for the 115 VAC MK VII EGPWC

PLUG (RACK)				
CONNECTOR	POSITION	TOP KEY	BOTTOM KEY	
ARINC 600	10	4	6	N/A

RECEPTACLE (BOX)				
CONNECTOR	POSITION	TOP KEY	BOTTOM KEY	
ARINC 600	10	1	5	N/A

For **MK-VII 115 VAC** unit use the keying table below.

CONNECTOR	POSITION	LEFT KEY	CENTER KEY	RIGHT KEY
ARINC 404A	15	3	1	5

CONNECTOR	POSITION	LEFT KEY	CENTER KEY	RIGHT KEY
ARINC 404A	15	6	4	2

For **MK-VII 28 VDC** unit use the keying table below.

CONNECTOR	POSITION	LEFT KEY	CENTER KEY	RIGHT KEY
ARINC 404A	88	4	3	5

CONNECTOR	POSITION	LEFT KEY	CENTER KEY	RIGHT KEY
ARINC 404A	88	6	2	1

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4.1.6 Front Panel Test Connector Mate

A test connector is provided on the EGPWC front panel. This provides access for a PC test monitor via RS-232. Reference *ICD* Appendix C for pinout and functional details. The mating connector for the EGPWC test plug is a male (pins) 15 pin double density D-subminiature type, Positronics Industries (kit) part number ODD15M1OYOZ or the following individual parts:

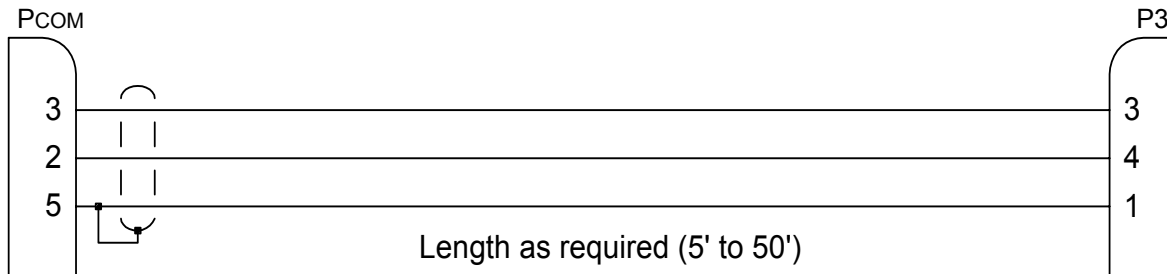
The connection between the PC serial port connector (with standard DB9) and the EGPWC RS-232 interface is defined as follows:

	RS-232 Receive	RS-232 Transmit	RS-232 Ground
EGPWS Front Connector (J3)	Pin 3	Pin 4	Pin 1
Standard (PC)* DB9 Connector	Pin 3	Pin 2	Pin 5

***NOTE:** Some PC Comm Ports have Pins 2 & 3 reversed from what is described above.

Connector, AMP 205161-1
Socket Contact, AMP 205090-1, QTY 3
M39029/63-368

Connector, AMP 204513-2*
Pin Contact, 204370-2, QTY 4*
M39029/58-360
Backshell, AMP 745854-5
Jackscrew, AMP 747784-3
Grommet Set, AMP 747746-1



* Alternate part number 748364-1 connector and 748333-4 or -7 pin contact.

4.1.7 MK VII EGPWS Installation Kit (HPN 755-7001-XXX)

Equipment Nomenclature	Description (Used On)	Item	Qty	Honeywell Part No.	041	042	043	044	045	045	047	048	049	050	054	055	056	058	059	060
Tray, Short	MK VII EGPWC Computer	Tray, Short	1	600-5705-004	X		X		X	X						X	X			
Tray, Long	MK VII EGPWC Computer	Tray, Long	1	600-5705-006		X							X	X					X	X
Upper EGPWC Connector	MK VII Tray	ARINC 600 Connector	1	440-0900-005	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X
Lower (115V) EGPWC Connector	MK VII Tray	ARINC 404 Connector, 115 VAC	1	440-0005-014				X	X	X			X	X						
Lower (28V) EGPWC Connector	MK VII Tray	ARINC 404 Connector, 28V	1	440-0005-031												X	X	X	X	X
Biax Mounting Kit	MK VII Accelerometer	Baseplate, Connector, Shims, etc.	1		X				X		X	X		X		X		X		X

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4.1.8 Cockpit Annunciators and Lamp Format's

All alert/warning lamp outputs are normally a steady state switch to ground. The lamps can be individually programmed to flash as a function of Flashing Lamps Option Set in ICD Category 4 (Attitude/Accel Select and flashing Lamp), refer to section 3.5.2. The flashing outputs operate at a nominal 70 cycles per minute at a 50% duty cycle. **For Windshear or Basic GPWS lights, contact Honeywell, Inc.**

The following table shows the indicators and controls associated with the Enhanced GPWS:

Indicator/Control		Color	Recommended Location	Function
Required Indicators and Controls				
Lamp Format TYPE 1 TYPE 2		Lamp Format is defined by the Aircraft Type		
GPWS (or Pull Up)	PULL UP	RED	In front of each pilot	GPWS or PULL UP warnings
BELOW G/S	GPWS (or GND PROX)	AMBER	In front of each pilot	GPWS or BELOW G/S alerts
GPWS FAIL or GPWS INOP		AMBER	In field of view	Indicates basic GPWS functions are inoperative
TERR INOP		AMBER	In field of view	Indicates that TAD and TCF functions are inoperative
TERR OFF or OVRD		WHITE	Within reach of both pilots	Indicates that TAD and TCF functions have been manually turned off
GPWS P/TEST (Note-1)		N/A	Within crew reach arc	EGPWS Press to Self-Test
G/S P/CANCEL (Note-2)		N/A	In front of each pilot	Press to cancel G/S function
TERR INHIBIT switch		Visible WHITE or BLUE	Within crew reach arc	Provides manual inhibiting of EGPWS TAD & TCF features, illuminated when features inhibited
Optional Indicators and Controls				
WINDSEAR WARNING		RED	In front of each pilot	WINDSHEAR warning
WINDSHEAR CAUTION		AMBER	In front of each pilot	WINDSHEAR caution
WINDSHEAR FAIL or WINDSHEAR INOP		AMBER	On center panel or EFIS annunciation	Indicates that Windshear detection is inoperative
G/S CANCELED (Note-3)		WHITE, visible BLUE or AMBER	In front of each pilot	On when G/S alerts are manually canceled
GPWS FLAP OVERRIDE		White Labeling AMBER	On center panel, near flap handle	Inhibits GPWS Mode 4B "Too Low Flaps" alert (pilot may manually reset)
GPWS VOICE OVERRIDE		AMBER	Within crew reach arc	Silences GPWS & TERR voice announcements
RAD ALT VOICE OVERRIDE		AMBER	On center panel	Silences radio altitude voice callouts on approach
WX RADAR RANGE Selector Knob		- - -	On WX radar controller	Controls range of display
TERR Display select switch		WHITE, visible BLUE or GREEN if not on DCP	Near each Terrain Display or on each Display Control Panel	Used to select terrain display

Note-1 Typically, GPWS Press to Test is a located on the red Pull UP or GPWS annunciator.

Note-2 Typically, G/S Press to Cancel is a located on the amber GPWS or Below G/S annunciator.

Note-3 Not FAA certified for Part 121 operators.

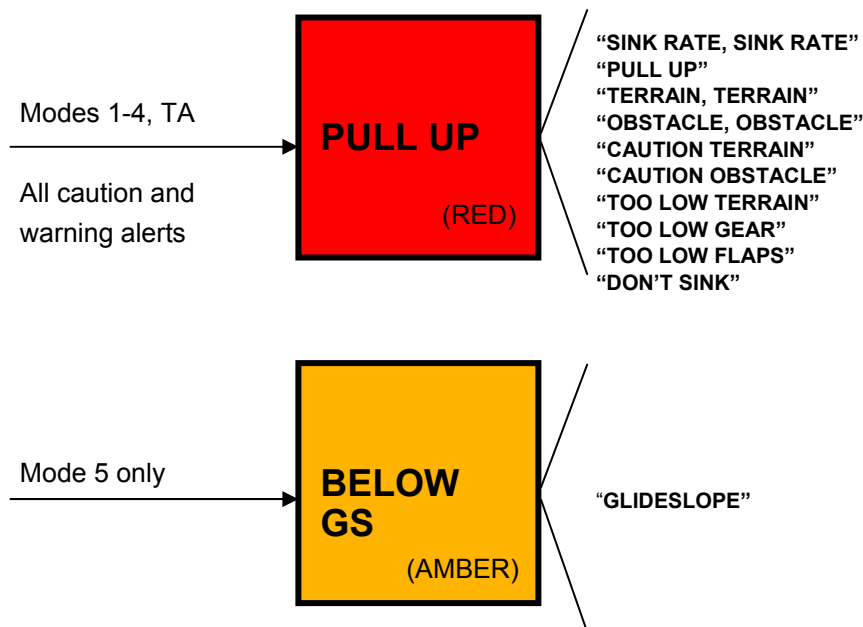
Table 4.1.8-1 Cockpit Annunciators

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Lamp Format 1

Description: Lamp Format 1 provides EGPWS warning (red) and caution (amber) alert lamp drive logic such that:

- Only a Mode 5 “**Glideslope**” alert will activate the caution lamp output (amber).
- All other alerts (except “windshear” and Mode 6 callouts) will activate the warning lamp output (red).



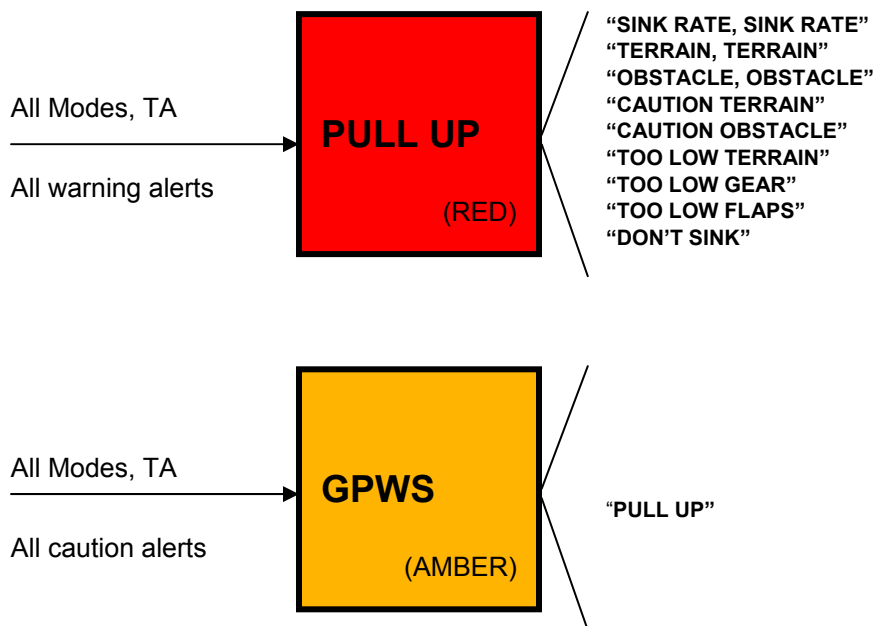
Windshear detection warning and caution functions activate separate lamp outputs.

Lamp output discretes are affected by “GPWS INHIBIT”, AND “GLIDESLOPE CANCEL” discretes, and maybe affected by Audio Inhibit Discrete.

Lamp Format 2

Description: Lamp Format 2 provides EGPWS warning (red) and caution (amber) alert lamp drive logic such that:

- Only the warning alerts containing the phrase “**Pull Up**” will activate the warning lamp output (red).
- All other alerts (except “windshear” and Mode 6 callouts) will activate the caution lamp output (amber).



For either format, these outputs are activated for Terrain or Obstacle caution/warning annunciations when enabled.

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4.1.9 Cockpit Annunciators

Table 4.1.9-1 shows sample Korry Mfg. lights that have been used in the past.

NOTE: MD-80/90 series aircraft Master Dimming circuit outputs three different dimming voltage levels; 9Vdc, 13Vdc and 15 Vdc. Most LED lamps require a minimum of 12 Vdc to operate. When interfacing the LED lamps to the Master Dim circuit on the MD-80/90 series aircraft, ensure that the LEDs are connected to either the 13 Vdc or 15 Vdc dimming outputs.

Korry P/N	Qty per A/C	Switch Type	Illumination Source	Legend Color	Legend Nomenclature	Voltage	Circuit Type	Switch Action	No. of Poles	Aircraft Types	PMA (Y/N)
433-673-1006-6120	1	433 (1")	LED	White Amber	OVRD FAIL	5 VAC 28 VDC		Alt.	4	767, 757, MD88/90	Y (757, 767)
311-1537-015	2	311 Base	N/A	N/A	N/A	N/A		Mom.	2	767, 757	N
17479-575	2	427 (5/8")	Incand.	Red Amber	GPWS GPWS	28 VDC 28 VDC		Mon.	2	A320	N
43300-002	2	433 (1")	LED	Green Amber	TERR INOP	28 VDC 28 VDC		Mom.	4	767, 757, 737	N
433-673-1006-6035	1	433 (1")	LED	White White	OVRD -----	5 VAC N/A		Alt.	4	767, B757	Y (737, 757, 767)
433-673-1006-6107	1	433 (1")	LED	White Amber	G/S INHB GND PROX	28 VDC 28 VDC		Mom.	4	767, B757	Y (737, 757, 767)
23246-303	1	318 Cap	LED	White	G/S INHB	28 VDC		N/A	N/A	737	N
23246-002	1	318 (1/2"x1")	LED	Amber	GPWS	28 VDC		Ind. (PTT)	1	737	N
23328-001	2	427 (5/8")	LED	Red	PULL UP	28 VDC		Mom.	2	747-200	N
23328-002	2	427 (5/8")	LED	Red Amber	WIND SHR WIND SHR	28 VDC 28 VDC		Indicator	0	747-200	N
23328-003	1	427 (5/8")	LED	White Amber	TERR INOP	28 VDC 28 VDC		Mom.	2	747-200	N
433-673-1006-6121	1	433 (1")	LED	White Amber	OVRD INOP	28 VDC 28 VDC		ALT Action	4	727 DC-9/-10 MD-80/90	Y (727 DC-9/-10, MD80/90)
433-673-1006-6144	2	433 (1")	LED	Green White	TERR WXR	28 VDC 28 VDC		Mom.	2	MD-80/90	Y MD-80/90

Table 4.1.9-1 Sample Lights

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4.1.10 Switching Relays

Switching relays are only used when required by the aircraft configuration to switch the displays between weather radar and terrain. Honeywell has no specific vendor recommendations for relays. The minimum relay requirements are:

- 4 PDT (Coaxial relays are not required.)
- Continuous duty cycle
- Pickup voltage: 13.5 VDC (maximum)
- Dropout voltage: 7.5 VDC to 20 VDC
- Coil resistance: $\approx$ 500 ohms
- Coil rating: 26.0 VDC (nominal) to 34.0 VDC (maximum)
- Contact V-drop: No more than 125 mV at rated load
- Contact current rating: 2A resistive at 28 VDC

The standard relay recommendation is BACR13CE2 (Boeing specification number; vendors vary), or Douglas relay specification number 5D0004-1 or equivalent.

4.1.11 GPS Antenna

A GPS antenna is required when installing a MK VII EGPWC that includes an internal GPS (part number 965-1076-020/030/060). Note: The MK VII EGPWC with internal GPS is not available prior to 965-1076-020-206-206. Recommended GPS Antennas are:

Sensor System L1 GPS Antenna Part Number	Description
Honeywell preferred	
S67-1575-133	An active ARINC 743A antenna with a 33dB pre-amp. Note: Boeing has selected this preferred antenna for all aircraft with MMR installations.
Alternate	
S67-1575-52	An active ARINC 743A antenna with a 26dB pre-amp.

EGPWS installations using the internal GPS require a GPS antenna and cabling. The GPS antenna should meet the following qualifications:

Frequency: 1575.42 MHz
Impedance: 50 ohms
Gain: 26 dB preferred
Power: 5 VDC
Qualification: TSO C129 or C129a or C144

The GPS antenna should be mounted on top of the fuselage in the centerline of the aircraft. Avoid mounting the antenna near any projections, the propeller, and the T-tail of the aircraft, where shadows could occur. It is recommended that there be a separation of at least 3 feet between the GPS antenna and any VHF Comm antenna on the aircraft. The GPS antenna baseplate must be level within $\pm 5^\circ$ in both axis when the aircraft is level (level is defined as the aircraft attitude required when weighing the aircraft for weight and balance). If the GPS antenna is tilted more than 5° or is mounted close to other objects that shadow it, loss of some of the satellites will occur and system performance degraded.

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4.1.12 GPS Antenna Cable Connector (J3)

The GPS antenna connector is required only for EGPWS installations with internal GPS receiver.

Vendor	MK VII EGPWS GPS Antenna Connector (J3)
Huber & Suhner	14BMA50-3-3C (or equivalent) <i>Use for coaxial cables with jacket outside diameters of up to 0.25".</i>
Huber & Suhner	36 BMA-TNC-50 3C (or equivalent) <i>Use for larger cables with a TNC adapter".</i>

4.1.13 GPS Cabling

GPS cabling is required when a MK VII EGPWC that includes an internal GPS (part number 965-1076-020/030/060) is configured for internal GPS operation. Note: The MK VII EGPWC with internal GPS is not available prior to -206.

The EGPWS requires an input signal of no less than -106 dB (at the EGPWS-GPS coax connector). Installers need to calculate signal strength, plus antenna gain, minus cable line loss to ensure that the input signal does not exceed the -106 dB limit. To calculate signal strength at the EGPWS coax connector, assume a received signal strength of -118 dB at the antenna (this is average signal strength from a GPS satellite at zenith over the antenna). Add the gain of the antenna, then subtract the line loss of the coax cable, and insertion loss at each connector, except at the EGPWS. Assume 0.6dB insertion loss per connector.

EXAMPLE: Active GPS Antenna with 26dB gain. A 40 foot coax cable run with 1 coax connector (at the rack disconnect). The cable has a specified line loss of 0.25dB/foot.

-118dB (received signal)
+ 26dB (antenna gain)
-92dB
-10dB (line loss) (0.25dB/foot x 40 foot run)
- 0.6dB (rack coax connector insertion loss)
= -102.6dB at EGPWS coax connector, better than required -106dB. This is an acceptable installation.

The maximum cable loss allowable between the GPS antenna and the EGPWC is:

GPS Antenna Part Number	Maximum Allowable Cable Loss
S67-1575-52	8dB
S67-1575-133	15dB

The following table shows the PIC, EMTEQ & ECS cable part numbers and the nominal attenuation of the various cables:

GPS Cable Part Number	
(PIC)	Attenuation (dB/ft)
S55122	0.068
S33141	0.094
S67163	0.098
(EMTEQ)	Attenuation (dB/ft)
TFLX480-100	0.044
TFLX295-100	0.070

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(ECS)	Attenuation (dB/ft)
310801-C	0.035
311201-C	0.055
311501-C	0.070
311601-C	0.086

4.2 Terrain Display Wiring

Terrain Display wiring must meet the weather radar display manufacturer's requirements including termination.

ARINC 429 bus wiring must be a twisted shielded pair.

ARINC 453 bus wiring must meet the following requirements:

- Cable length must be 300 feet (91.4 meters) or less
- Wire to wire capacitance must not exceed 50 pF/foot
- Shielded twisted pair with not less than one twist/inch
- Impedance of 70-78 ohms $\pm$ 10% at 1 MHz
- PIC wire and cable part number: D620224

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4.3 Vendor Contact Information

The vendor contact information provided below is current at the time of publication of this document.

AMP (TYCO)	2800 Fulling Mill Road Middletown, PA 17057 800 522-6752	www.amp.com
Barry Controls	Burbank, CA 818 843-1000	www.barrycontrols.com
	United Kingdom: 44 (1932) 255255	www.barrycontrols.co.uk/distributors.html
The Boeing Company	Seattle, WA 425-865-7950 Fax: 425-865-7841	AirplaneServices@boeing.com
Burndy (Souriau) Framatome	Manchester, NH 603 647-5182	
EATON Corp		www.aerospace.eaton.com/aftermarket_services/find_distributors1.asp
Electronic Cable Specialists and Electrical Conservation Systems, Inc.	5300 W Franklin Drive Franklin, WI 53132-8642 800-327-9473	sales@ecsdirect.com
Electrical & Mechanical Technologies (EMTEQ)	New Berlin, WI 53151 888 679 6170	sales@emteq.com
Hollingsead International	Sante Fe Springs, CA 213 921-3436	www.hollingsead.com/contact.htm
Huber & Suhner	630-250-0100 www.hubersuhnerinc.com/co-ca-us/ie55/ca-us-u-org/ca-us-u-org-dist.htm	
IDD Aerospace	Redmond, WA 425 885-4353	www.iddaerospace.com
ITT Cannon	Santa Ana, CA 800-854-3028	www.ittcannon.com/support/dealers.asp
Korry Electronics	901 Dexter Avenue North Seattle, WA Attention: Airline Sales 800 257- 8921	www.korry.com/customer_service

For orders and AOG requirements, contact:

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Sonya Cordova
206 281-3567
email: scordova@korry.com
fax: 206 281-3576
SITA: SEAKEXD

For engineering inquiries, contact:

Bob Jacques	Tom Howard
Airline Business Manager	Airline Business Manager
206 281-3584	206 281-1458
email: bjacques@korry.com	email: thoward@korry.com
fax: 206 273-4128	fax: 206 273-4128

Master Specialties Co.	See Eaton above	
PIC Wire & Cable Supply	Sussex, WI 53089 800 742-3191	www.picwire.com/contactbody.asp
Sensor Systems, Inc.	8929 Fullbright Avenue Chatsworth, CA 91311 818 341-5366	www.sensorantennas.com/antennas.htm
TRI-Star Electronics	El Segundo CA 310.536.0444	www.tri-starelectronics.com/sales_info.html
West Coast Specialties	Bellevue, WA (425)283-0460	www.wescospec.com/sales.htm

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4.4 Sample Parts Lists, Lights and Lightplates

4.4.1 Aircraft Type 6 (Boeing 727-200) American Airlines

Installation Parts List				
The list is a sample "Installation Parts List" based on installation of the EGPWS MK VII P/N 965-1076-001-204-204, Aircraft Type 6, B727-200 American Airlines.				
ITEM	QTY	VENDOR	PART NO.	DRAWING NO.
EGPWS B727 PLACARDS			KIT H4360-1 & 4360-5	CBB5021
Switchlight Capt. - P1-3	1		AL5038	CBB5021-1
Terrain Sys OVRD – F/O P3-2	1		AL6061	CBB5021-5
EGPWS SWITCH Lights Placards				CBY2039
Terrain Sys OVRD	1		CTY2039-1	
EGPWS SWITCH OVRD / FAIL		Korry Mfg	433-673-1004-4120	
With Clearguard		Korry Mfg	433-100-002	
EGPWS CONNECTOR PLACARD			AM4078	CBB5021-3
Contacts (J2 connector)		Boeing	BACC47EF1	

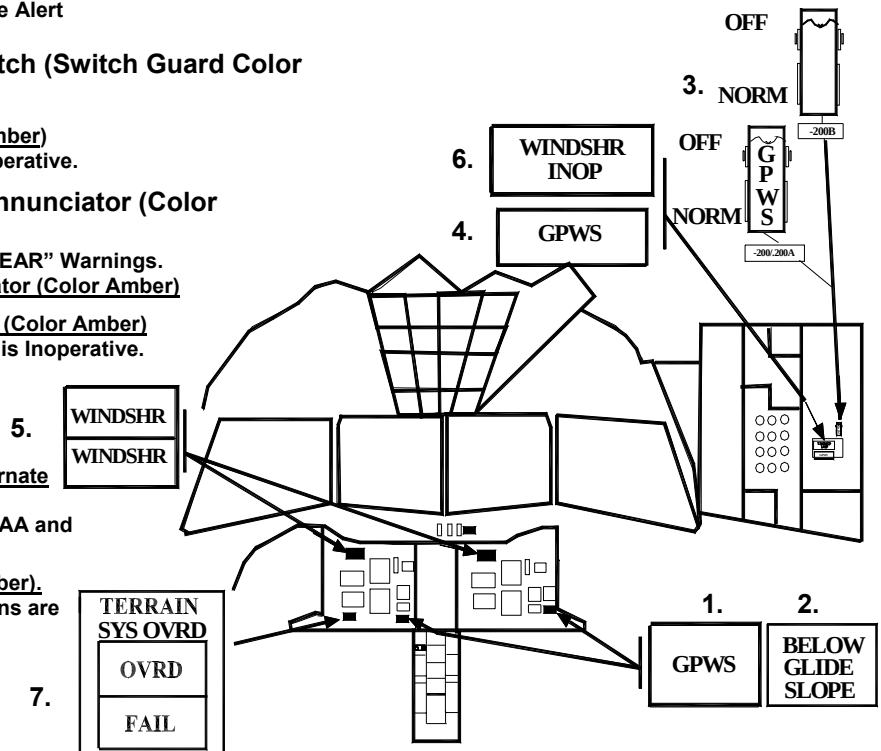
EXISTING

The following Indicators and Controls associated with the EGPWS:

1. EGPWS Annunciator (Color Red).
 - a) Illuminates for EGPWS "PULL UP" Warnings and Alerts except for "Glideslope"
 - b) "Press to Test", activates EGPWS Self Test.
2. BELOW GLIDESLOPE Annunciator/Momentary Switch (Color Amber)
 - a) Illuminates for EGPWS "GLIDESLOPE" Alerts.
 - b) "Press to Inhibit", Glideslope Alert
3. **GPWS AUDIO INHIBIT Switch (Switch Guard Color Black)**
4. GPWS fail Annunciator (Color Amber)
Illuminates when "GPWS" is Inoperative.
5. **WINDSHEAR WARNING Annunciator (Color Red).**
6. WINDSHEAR CAUTION Annunciator (Color Amber)
6. WINDSHEAR INOP Annunciator (Color Amber)
Illuminates when "WINDSHEAR" is Inoperative.

NEW

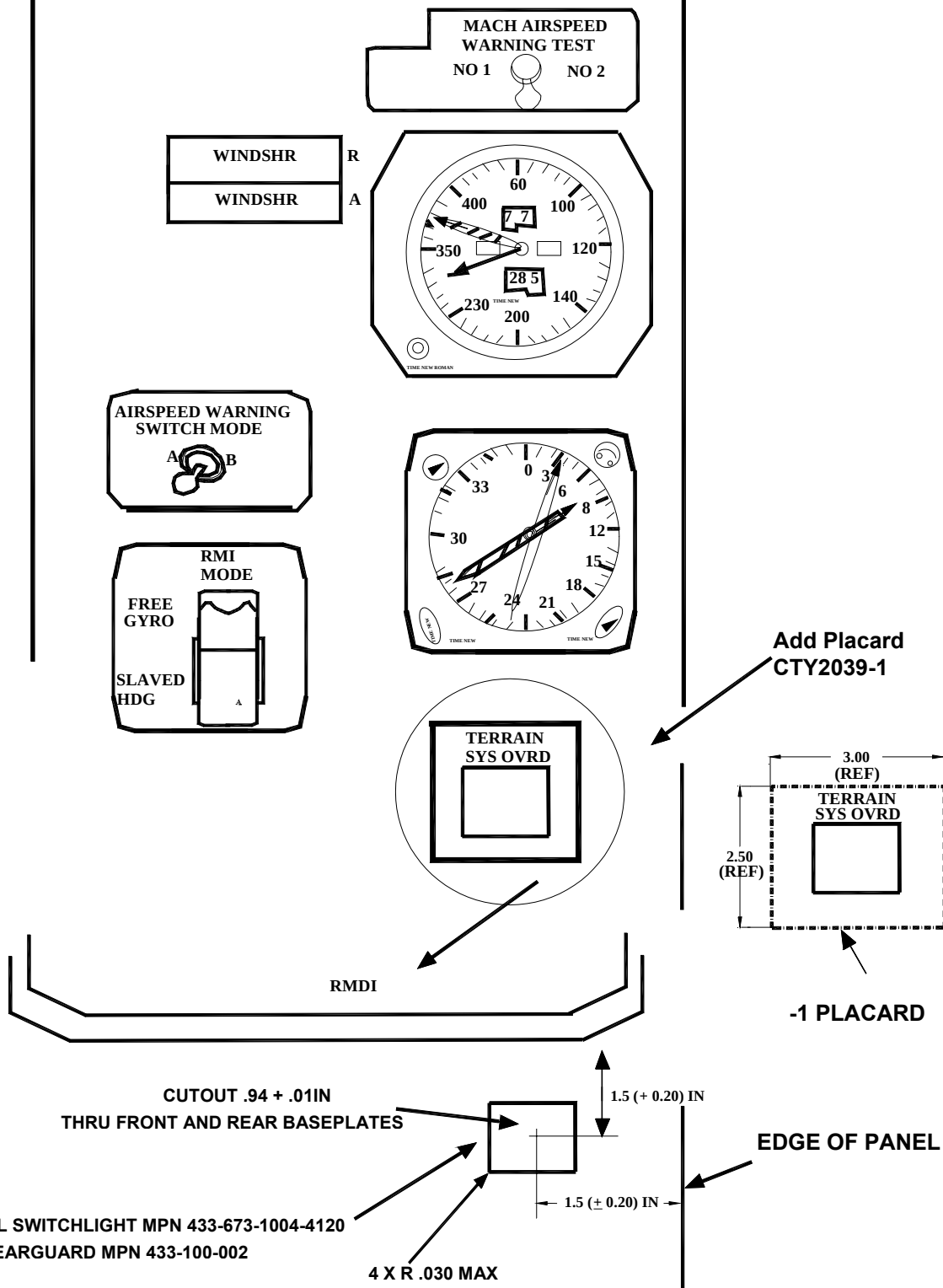
7. TERRAIN OVERRIDE Annunciator/Alternate Action Switch (Color White).
Illuminates when depressed, Inhibits TAA and TCF functions.
- TERRAIN FAIL Annunciator (Color Amber).
Illuminates when TAA and TCF functions are inoperative.



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LIGHT LOCATIONS and DESCRIPTION

1. Captains Instrument Panel (P1-1)



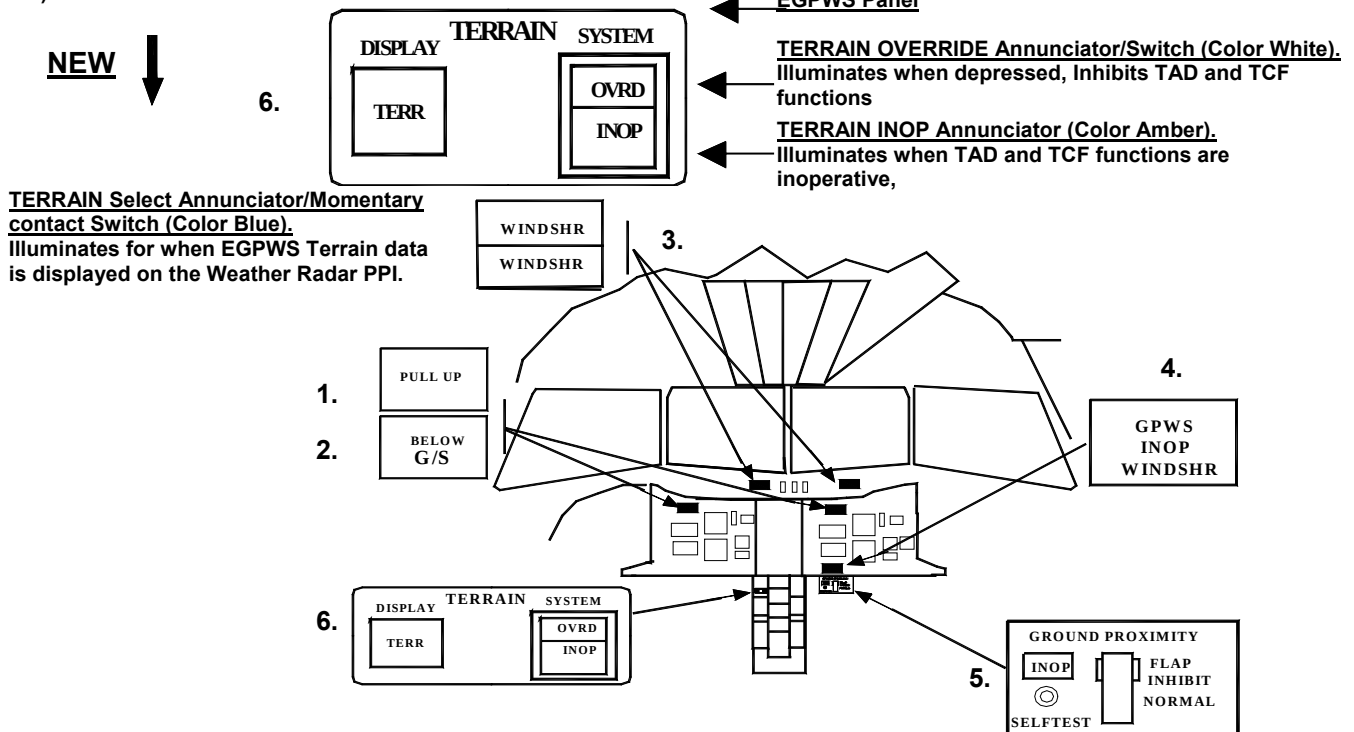
4.4.2 Aircraft Type 6 (Boeing 727-200) Federal Express

The list is a sample "Installation Parts List" based on installation of the EGPWS MK VII P/N 965-1076-001-204-204, Aircraft Type 6, B727-200 Federal Express.

ITEM	QTY	VENDOR	PART NO.	DRAWING NO.
EGPWS PANEL Model RGT-102	1	EMH TECH	907-1102-122	807-1102-001
MOUNTING PANEL	1	EMH TECH	910-1410-215	821-1410-215
RELAY, 4 PDT			BACR13CE2	
SWITCHING RELAY CONNECTOR			BACS16AF1	
BRACKET			Z-34-009-1	

The following Indicators and Controls associated with the EGPWS:

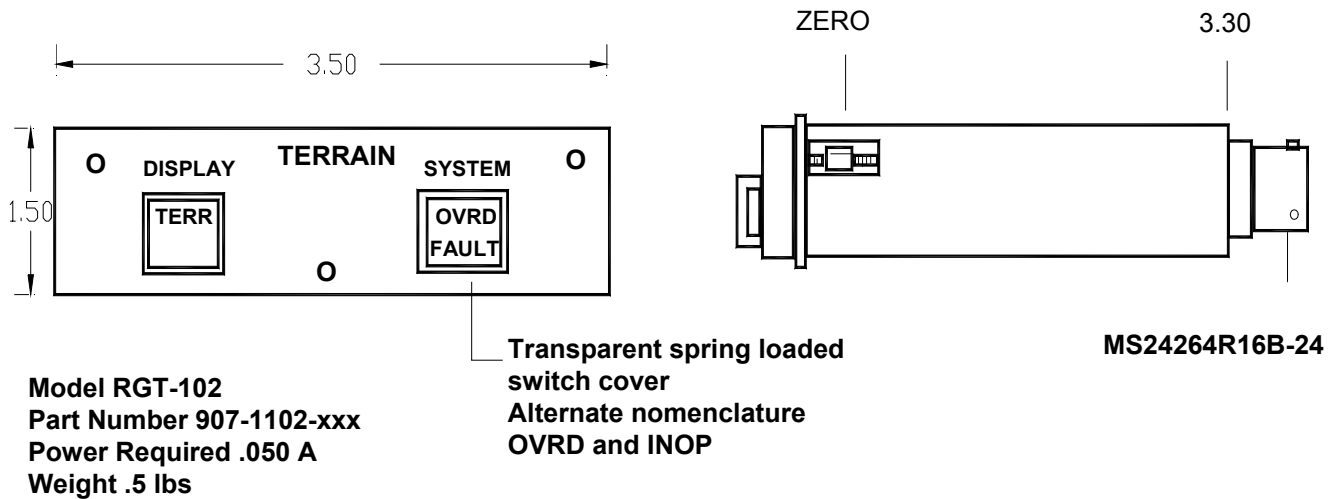
- NEW**



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LIGHT LOCATIONS and DESCRIPTIONS

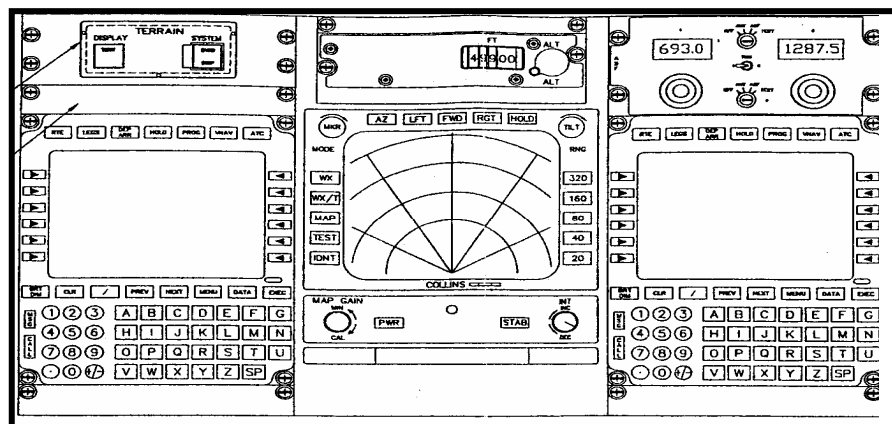
1. Panel – EGPWS



2. Pedestal

REF.
907-1102-122

REF.
BACP10U0075G



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4.4.3 Aircraft Type 16 (Boeing 747-200) British Airways

Installation Parts List

The list is a sample "Installation Parts List" based on installation of the EGPWS MK VII P/N 965-1076-001-206-206, Aircraft Type 16, B747-200 British Airways with Honeywell Advisory Map Display.

ITEM	QTY	VENDOR	PART NO.	DRAWING NO.
ANNUNCIATOR	1	KORRY	23328-002	060-4199-088
ANNUNCIATOR	1	KORRY	23328-001	060-4199-088
GLARESHIELD MODIFICATION				060-4199-088
RELAY, 4 PDT		QPL	M83536/16-022	060-4199-085
RELAY SOCKET		QPL	M12883/40-01	060-4199-085
TERRAIN OVRD Switch Light – P10		KORRY		060-4199-086
TERRAIN DISPLAY Sel TERR Light		KORRY		060-4199-086
TERRAIN DISPLAY Sel INOP Light		KORRY		060-4199-086
CLEAR GUARD, FLIP		KORRY	10897-014	060-4199-086

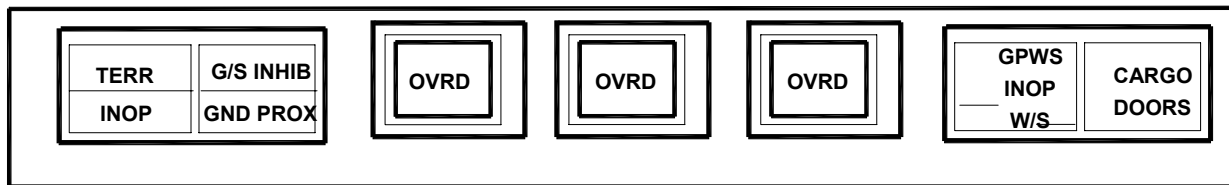
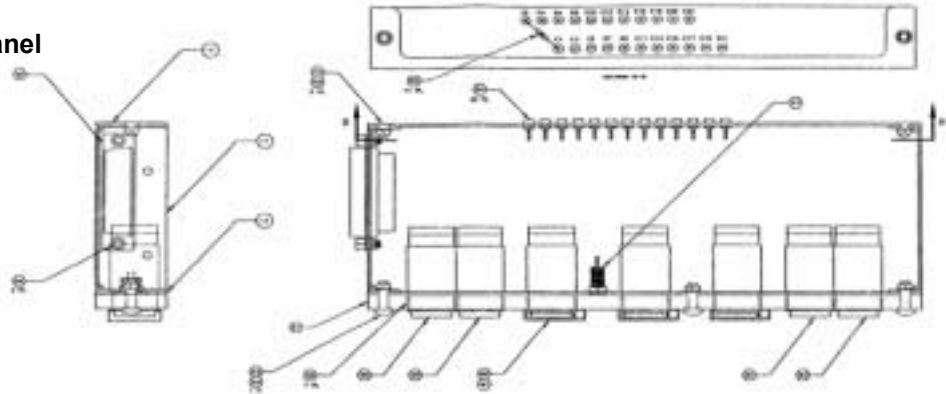
The following Indicators and Controls associated with the EGPWS:

PULL UP lights (2)	RED	Captain's and FO's Glare Shields	EGPWS warnings.
GND PROX light	AMBER	P10 Panel	EGPWS cautions.
G/S INHIB light/switch	WHITE	P10 Panel	Push to inhibit, push to re-enable Mode 5 "Glideslope" alerts. illuminates G/S INHB when "Glideslope" alerting is inhibited.
WIND SHR lights (2)	RED	Captain's and FO's Glare Shields	Reactive Windshear warning.
GPWS INOP light	AMBER	P10 Panel	Indicates GPWS inoperative.
WIND SHR INOP light	AMBER	P10 Panel	Indicates Windshear inoperative.
GEAR OVRD switch light	White	P10 Panel	Inhibits GPWS Mode 4A "Too Low Gear" caution. (May be manually reset by pilot).
FLAP OVRD switch light	White	P10 Panel	Inhibits GPWS Mode 4B "Too Low Flaps" caution. (May be manually reset by pilot).
TERR OVRD switch light	White	P10 Panel	Inhibits TAAD and TCF Functions, (May be manually reset by pilot).
Terrain Display Select TERR light/switch	Green	P10 Panel	Provides manual Selection/deselection of EGPWS terrain/obstacle display. Indicates the display is active.
Terrain Display Select INOP light	AMBER	P10 Panel	Indicates the terrain/obstacle Display is not available
GPWS TEST switches (2)	None	Captain's and FO's Glare Shields	Activates the EGPWS self test (ref section V.7).

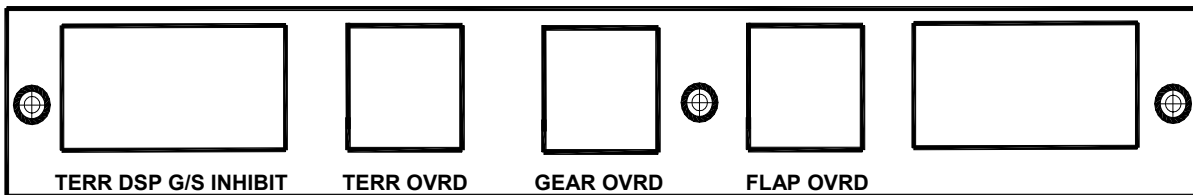
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LIGHT LOCATIONS and DESCRIPTION

1. P10 Annunciation Panel



2. P10 Panel Overlay



-1 OVERLAY

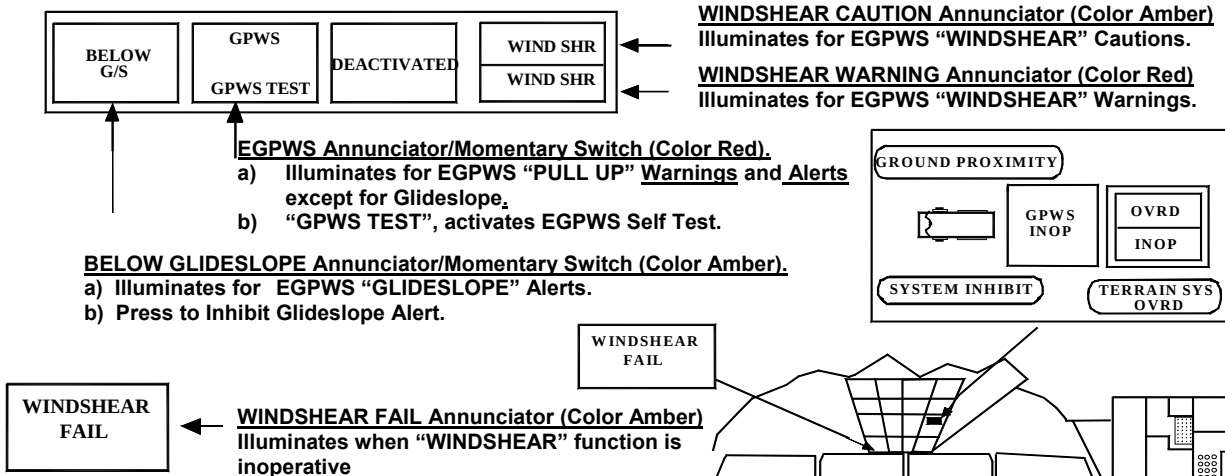
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4.4.4 Aircraft Type 14 (DC10-10,-30-40)) North West Airlines

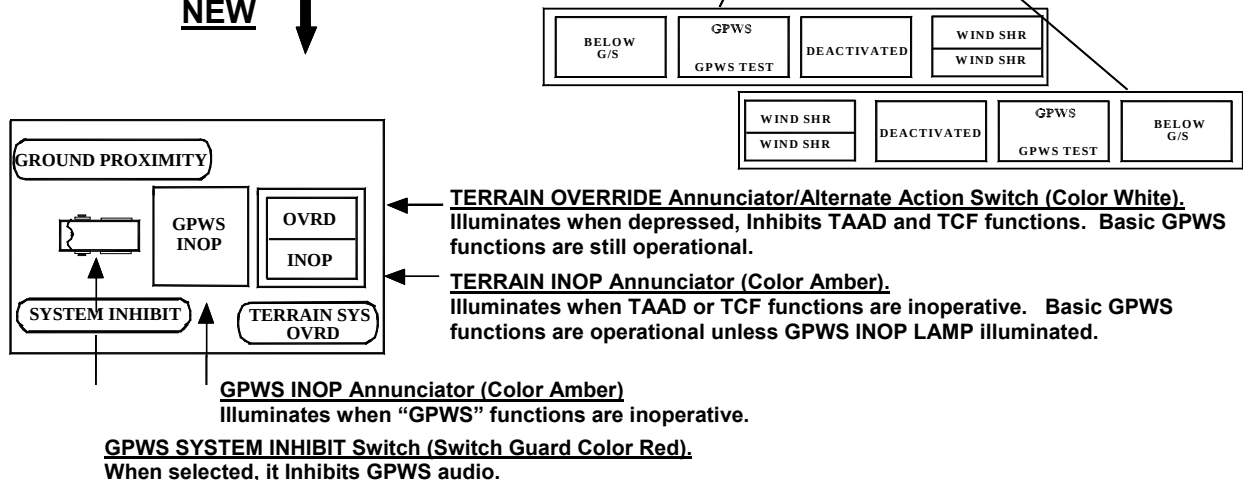
Installation Parts List				
The list is a sample "Installation Parts List" based on installation of the EGPWS MK VII P/N 965-1076-001-204-204, Aircraft Type 11, North West Airlines (DC-10-10), Type 14 (DC-10-30, -40) with Internal GPS.				
ITEM	QTY	VENDOR	PART NO.	DRAWING NO.
EGPWS DC PLACARDS KIT	1		R4653-4	
SWITCH LIGHT Capt. P1	1		CDH4836	CDH4836-1
EGPWS SWITCH LIGHTS PLACARDS				CTY2039
Terrain Sys OVRD	1		CTY2039-1	
EGPWS SWITCH LIGHT (AL2-67)		Korry Mfg	433-673-1004-4120	
CLEARGUARD		Korry Mfg	433-100-002	
ANTENNA KIT	1	ASM		K5519-0000-00
ANTENNA	1	Sensor Systems	S67-1575-52	K5519-3010-00
COAX Cable	1	PIC	S33141	
PLACARD GPS	1	ASM		5519-6007-00

EXISTING ↓

The following Indicators and Controls associated with the EGPWS:



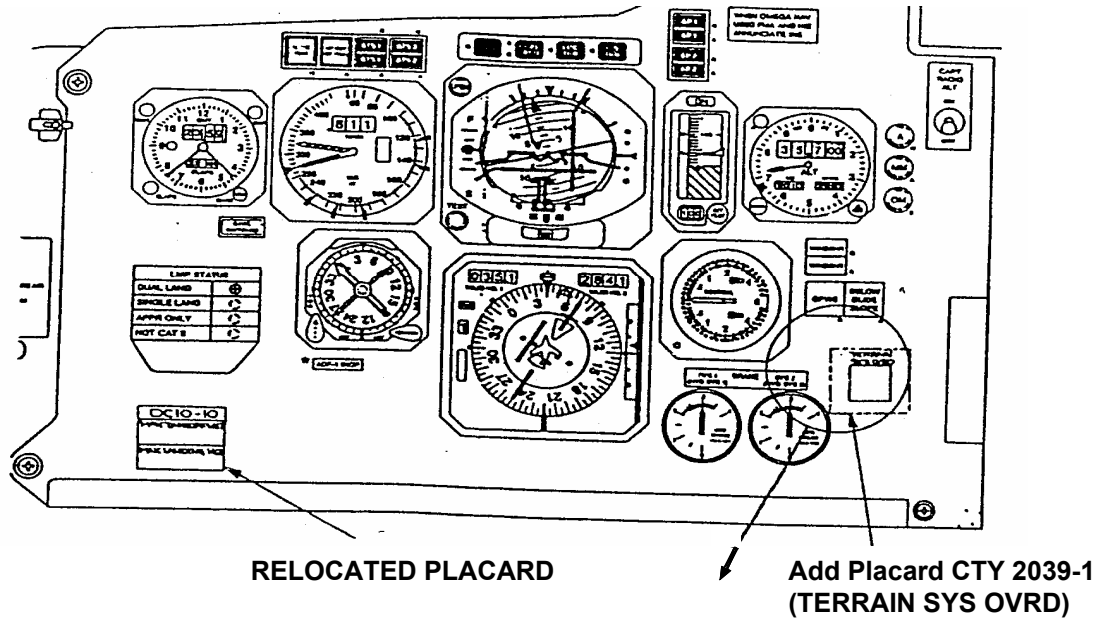
NEW ↓



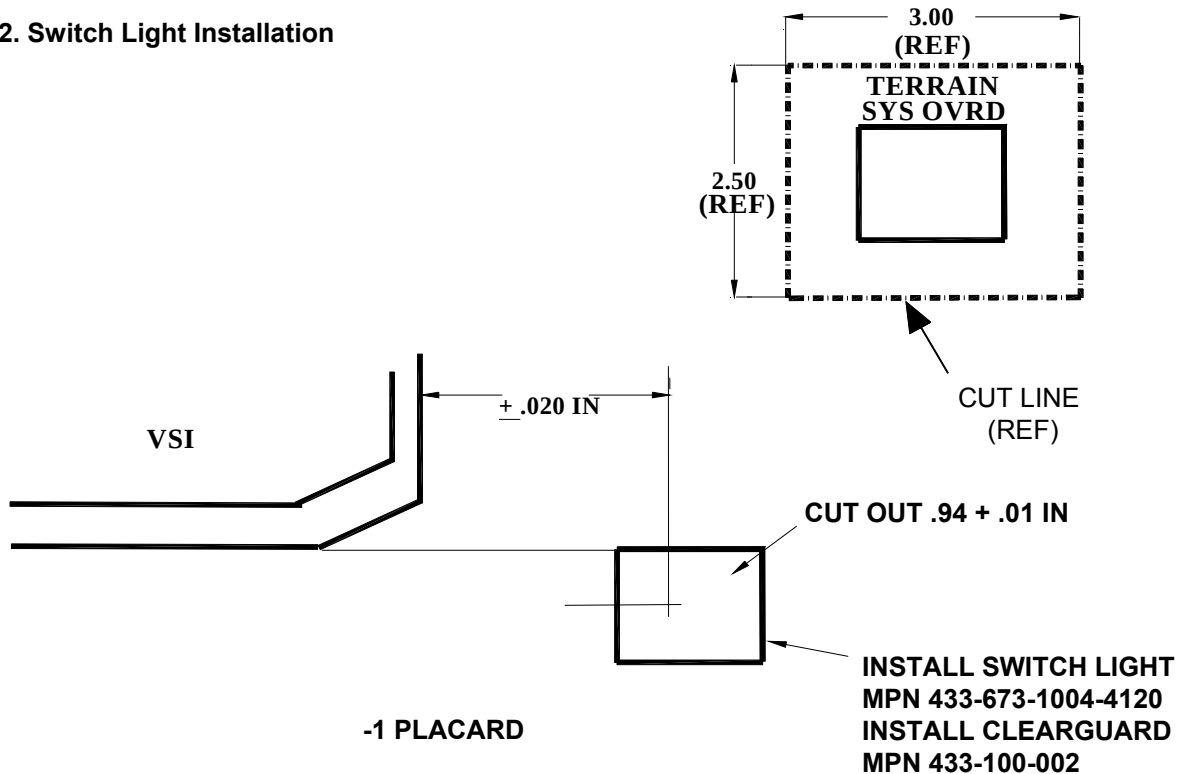
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LIGHT LOCATIONS and DESCRIPTIONS

1. Captains Instrument Panel

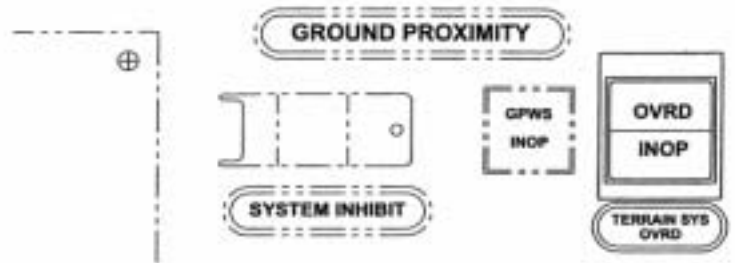
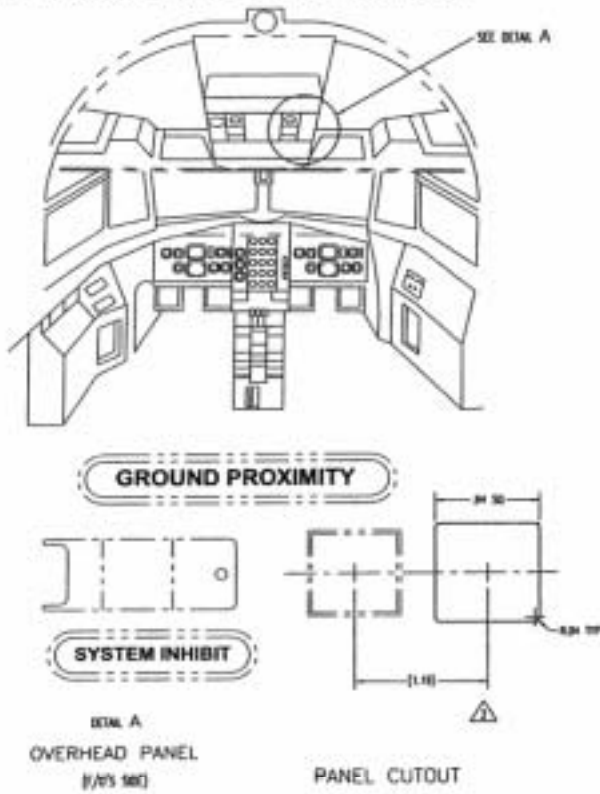


2. Switch Light Installation



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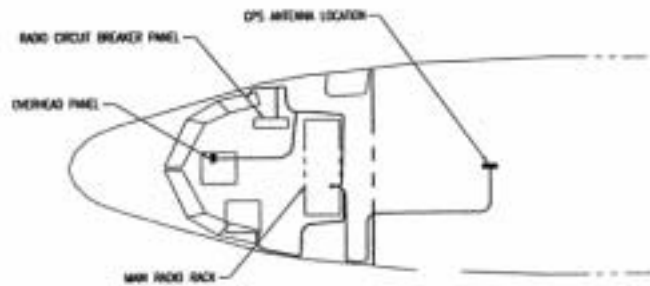
1. F/O's Overhead Panel Annunciators



Placards-



2. Antenna Location



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5.0 Installation/Ground Check Procedure

Honeywell ground test procedures are available for some aircraft upon request. If a ground test procedure is not available for a particular aircraft, Honeywell will provide assistance generating a procedure.

The MK VII EGPWS provides RS-232 ports via the front and rear connectors to support monitoring of internal parameters for testing purposes. The monitoring of these parameter values enables the operator to quickly determine if the correct signal and scaling is being used by the EGPWS computer.

For testing purposes, Honeywell provides, free of charge, a terminal emulation program called WinVIEWS designed to run on a Windows (3.1 or later) based PC. To use WinVIEWS, an RS-232 cable must be fabricated to interface between a PC and the EGPWC front panel connector or between a PC and a breakout of RS-232 from the EGPWC rear connector.

The PC connector is a 9-pin "D" female that attaches to the serial port interface. The EGPWS front connector is a 15 pin "D" (Positronics Industries kit PN ODD15M1OYOZ, or equivalent). The table below shows the wiring of the 3-wire RS-232 cable.

	RS-232 Receive	RS-232 Transmit	RS-232 Ground
EGPWS Rear Connector	Pin J2-A6	Pin J2-A5	Pin J2-A4
EGPWS Front Connector	Pin 3	Pin 4	Pin 1
Standard DB9 Connector (for a PC)*	Pin 3	Pin 2	Pin 5

***NOTE:** Some PC Comm Ports have Pins 2 & 3 reversed from what is described above.

The communication link utilizes the RS-232 Communication Protocol configured as follows:

19200 Baud, No Parity, 8 bits, and 1 stop bit.

The EGPWS will activate the first RS-232 port (front or rear) upon which it receives the link initialization character (control z) after power on.

5.1 WinVIEWS

WinVIEWS OPERATION:

Windows Virtual Interface to the Enhanced Warning System

WinVIEWS software is a tool developed by Honeywell to monitor or view values within the EGPWS. The WinVIEWS software provides a monitor function that does not alter the operation of the EGPWS. The monitoring of values assists in the installation testing of the EGPWS by allowing the operator to quickly determine if the correct signal and scaling is being used by the EGPWS. Additionally, WinVIEWS provides a detailed status of the software configuration and input signals, which enables quick identification of system anomalies.

WinVIEWS software can be downloaded free-of-charge from the Honeywell website:

<http://www.honeywell.com/sites/aero/Egpws-Home.htm>

Installation Information

Block Diagrams, Outline Drawings & WinVIEWS Software

Executable Software (self extracting zip file)

The software consists of the WinVIEWS executable file, a help file, and sample command files. Save the Executable zip file in a *WinVIEWS* folder on your PC hard drive and execute to expand. A User's Guide to WinVIEWS is also available to be downloaded at this same website along with the MK VII Ground Testing Command Files.

The command file is a simple text file that should include each CVT Item used in the test procedure. A sample command file for this test procedure is found below. The file must be a 'Text Only' type of file, such as those created in the Microsoft Windows NotePad program. It should have a filename extension of **.WVC** (or **.CMD**). Once this file is loaded, WinVIEWS can automatically display the current value of each parameter listed in the command file.

Normal Operation for Ground Testing the EGPWS:

STEP 1 - Connect the PC to the EGPWS via the RS-232 cable as defined above.

STEP 2 - On the PC, start Windows 3.1, or higher.

STEP 3 - Start the WinVIEWS program. Ensure the box "Automatically send command file after connect" is not selected. Click on "Connect".

STEP 4 - Under the File Menu select the "Load Command File" option (or Press" F1) and load the appropriate Command File.

STEP 5 - Use F6 to select Data Display Mode (if it does not start automatically). Each CVT Item listed in the Command File will be continuously updated at a rate of greater than once per second. The values shown for the CVT Items listed will be the test values.

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Command File: MK7_GTP.WVC (Example)

The format for the WinVIEWS command file is:

1. ASCII Text Only; no spaces
2. A CVT Item as specified in the test procedure
3. Each CVT Item Name is followed by a <return> or <enter>
4. Note: Each CVT must be on a separate line in the command file (not in table form as shown below).

AACMHdVal	GSInh	RawBCAlt1	RawIMHd1
ABarOt1Val	RawBAIt1	RawBarOt1	RawITHd1
ACAS1Val	M6LwVolDsc	RawGAlt1	RawRoll1
ACASVal	RawHFOM1	RawBaRtSy1	RawITHd2
AGS1Val	ILSTuned1	RawCAS1	RawLngAcc1
ALoc1Val	LandFlDn	RawFGSpd1	RawLoc1
AnaCrAlt	LandFlDsc	RawFLat1	RawNrmAcc1
AnAtt1Val	LandFlFAng	RawFLng1	RawPitch1
ARA1Val	LandGrDsc	RawFMVar1	RawRA1
ARA2Val	LandGrDn	RawFTTk1	RawRA2
AudInhDsc	MomAudSup	RawGLat1	RawSAT1
CalloutEnb	PosSrce	RawGLat2	RawVFOM1
DHDsc	PosUncert	RawGLng1	StpAppEnb
FlapPos1	RawAACAOA1	RawGLng2	StpAppSel
FlapPos2	RawAACCAS	RawGMVar1	TA_NotAvail
FlapPos3	RawAACCAS1	RawGMVar2	TANvMode1
FlapPos4	RawAACGS1	RawGS1	TAWxRng1
GPSLatude1	RawAACLoc1	RawHFOM1	TAWxRng2
GPSLngude1	RawAACMHD	RawHIL1	TerrDis
GPWInop	RawAACSAT	RawHIL2	WSInop
GSCan	RawHFOM2		

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6.1 Questions & Answers

Additional Documentation

Q: Where can I get information on EGPWS software upgrades, hardware mods, and Terrain Database upgrades?

A: This information is handled via Service Bulletin. Service bulletin information can be received by two methods. First, visit our Internet website at <http://www.honeywell.com/sites/aero/Egpws-Home.htm>. Second, call Honeywell, Avionics Technical Assistance (at 877-436-2005 or 602-436-2005) and ask for the necessary bulletins.

Air Data Computers

Q: I am interfacing a Honeywell AZ-242 Air Data Computer to a MK VII EGPWS and cannot find a source of Uncorrected Baro Altitude. What do I do?

A: The AZ-242 does not output Uncorrected Baro Altitude. Parallel the Corrected Baro Altitude course and fine synchro outputs to the Uncorrected Baro inputs. The standard air data ground test should be modified to accommodate this. Instead of remaining constant, the variable RawBAIt1 will change when corrected baro adjustments are made.

Altitude Callouts

Q: Why don't I hear the selected altitude callouts during approach?

A: You may have forgot to ground the Altitude Callout Enable discrete input, (J2-F04).

Q: The pilots are complaining that the Mode 6 Altitude Callouts are too loud. Can I adjust them separately, without affecting the overall Alert volume?

A: Yes, by activating the Mode 6 Low Volume discrete, (J1A-01), Mode 6 Volume Reduction Program Pin (PP12, J1A-28), or Alternate Mode 6 Volume Program Pin (PP22, J2-A9) or choosing an Altitude Callout menu that indicates *Low Volume*.

Flap wiring

Q: The default flap logic is backwards from how I intend to wire it. Do I have to use a relay to reverse it?

A: No, the MK VII EGPWS provides a Flap Reversal program pin option. ***As shown below:***

Indication of Flaps Down		Indication of Flaps Up		Flap Reversal Required
J1B-24 GND or	J1A-24 28V	J1B-24 Open or	J1A-24 Open	Yes
J1B-24 Open or	J1A-24 Open	J1B-24 GND or	J1A-24 28V	No

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Q: Is Flap reference voltages different for DC-9 and DC-10 aircraft?

A: Flap reference polarity is reversed for DC-9/DC-10 aircraft types 11,13,14, 60, 61 because
The flap position synchro is indexed 180 degrees from the standard synchro indexing.

Flight Testing

Q: During the flight test we received the GPWS Inop light. What caused that?

A: The most likely cause is selection of the flap override when airspeed was above 250 knots.
Reduce speed below 250 knots before selecting flap override (test profile recommends 220 knots airspeed).

Q: I am installing EGPWS using an existing STC. Do I need to flight test the system?

A: No.

Q: I am replacing a MK VII GPWS with EGPWS. Do I need to flight test the system?

A: Yes, but only the enhanced functions need to be tested. **NOTE:** This is subject to FAA
Approval. Coordinate the installation with the cognizant FAA Aircraft Certification Office.

General Installation Issues

Q: Can I use 115 VAC Reference Voltage?

A: A number of MK VII EGPWS analog input require an accompanying AC reference input.
Several examples are listed below.

- Aircraft Type Category 1, A/C Type 40 (B737-200 ADV) AOA/Flap Angle Data Select 16 (H = J2-G14, C = J2-G15).
- Air Data Category 3, Air Data types, 0, 1, 8 -10, 13 (H = J1B-39, C = J1B-40).
- Position Input Category 7, Any ID that uses MAG HDG Synchro Position Input #24 (H = J2-G10, C = J2-G11).

In the past with the MK VII GPWS units, it has been the practice to use 115 VAC, 400Hz (e.g. A/C input power to the MK VII) as the reference voltage.

CAUTION: Not all of the MK VII EGPWS AC reference inputs can handle 115 VAC.

ONLY the following AC Reference Voltage inputs are designed to handle 115 VAC:

- J2-G08 (H) and J2-G09 (C)
- J2-G10 (H) and J2-G11 (C)

All other AC reference inputs are limited to 50 V peak input (~28 VAC).

A number of existing MK VII installations use 115 VAC inputs to J1B-39 and J1B-40 (ADC and Corrected Baro Altitude Reference inputs).

The MK VII EGPWS can only handle 28 VAC on these inputs.

If you encounter an installation that can only provide 115 VAC as a reference and the ICD defines only a 28 VAC reference input for that category, contact Honeywell.

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Q: How do I know if the avionics equipment on my aircraft will work properly with EGPWS?

A: Most of the interfaces used are ARINC 429. The best check is to verify that the avionics equipment provides all the 429 labels the EGPWS requires, and provides them at the update rate (or faster) that the EGPWS requires. You may also obtain a customer worksheet via website:

<http://www.honeywell.com/sites/aero/Egpws-Home.htm>

Installation Information

Installation & Design Guides

Customer Installation Worksheets

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Fill out this form in as much detail as possible and email to CRC-CES-TAG@Honeywell.com. The form will be reviewed by EGPWS Applications engineering, and you will be contacted about the results.

Global Positioning Systems (GPS)

Q: My aircraft has an older 2 channel GPS. Can I use that for position input?

A: It depends on the part number of EGPWS being installed. If the EGPWS part number ends with -206-206 (or later) all GPS connected must be 8 channel (or more) with RAIM capability. If the EGPWS part number is -204-204 (or earlier) there are no specific requirements on GPS connections, provided the GPS meets ARINC 743A format.

Q: I want to install EGPWS into an aircraft that does not have a GPS position source. Can I do that?

A: Yes, the best way to do that is to install an EGPWS with a built-in GPS card. The Internal GPS MK VII EGPWS part numbers are 965-1076-020, 965-1076-030, & 965-1076-060 and require an external GPS antenna installation.

Q: I heard there are special rules when interfacing EGPWS with a Universal UNS-1 GPS. What are they?

A: EGPWS Service Information Letter #13 describes the reasons for the unique requirements. The UNS-1 GPS (GPS-1000 engine in UNS-1B+, -1C, -1D, -1K and -1M) can only be connected to EGPWS with software versions -208-208 or later. The ARINC 743 and WGS-84 program pin options must be activated when interfacing UNS-1 GPS to EGPWS. There are no limits on the FMS connection from an UNS-1 system.

Radio Altimeters

Q: Can I use a Collins ALT-50 with EGPWS?

A: See SIL EGPWS-MKV/MKVI/MKVII/MKVIII-43.

Terrain Awareness Function

Q: When the Terrain Inhibit button is pressed, why doesn't the Terrain Inop annunciator illuminate?

A: This is not a function of the EGPWS. The Terrain Inhibit button should illuminate when pressed. This is the annunciation to the pilot that the terrain feature is inhibited. If desired, the installer may hand wire the system such that the Terrain Inop will illuminate when Terrain Inhibit is selected.

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- Q:** The Terrain Inop annunciator is illuminated when inside the hangar, but the Self-Test does not indicate any faults. Why?
- A:** If the EGPWS is a –206-206 or later, this is normal for installations that have GPS wired directly, but do not receive the Nav Mode word (label 266) from the FMS. In the hangar, GPS is inoperative, so the EGPWS looks for a FMS position of *known accuracy*. The Nav Mode word is the only way to provide the known accuracy. Other alternatives are to install a GPS repeater antenna in the hangar, or use WinVIEWS to force the position uncertainty to a value less than 1.0 (type “COV PosUncert 0.5”).

Windshear Alerting

- Q:** I am not activating windshear on this installation. What interfaces can I skip?
- A:** You do not have to provide a source of longitudinal/normal acceleration, angle of attack, and flap position. You still need to provide a landing flap discrete (full down) signal for Mode 4B alerting.
- Q:** I have wired the angle of attack to a potentiometer as instructed, but do not get the proper output (in degrees). What could be wrong?
- A:** Two possible wiring errors may have occurred. The low side of the potentiometer must be tied to aircraft ground. Also, EGPWS must be the only wiring connected to a potentiometer when the EGPWS is providing the 5 VDC excitation.
- Q:** I want to activate Windshear alerting, but the aircraft has no source of normal or longitudinal acceleration. How can I do it?
- A:** Use the Honeywell Biaxial Accelerometer (PN 979-0223-001) along with a MK VII EGPWS (PN 965-1076-0XX-XXX-XXX). When ordering an install kit, remember to order mounting hardware for the accelerometer.

After Installation

- Q:** What tools are available to help in troubleshooting EGPWS installations?
- A:** Honeywell provides a Windows based software tool called WinVIEWS free of charge. This program automates some of the self-test functions, and gives the capability of viewing software variables (called CVT Items) in real-time. To obtain a free copy of WinVIEWS, see Section 5.1.

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6.2 TroubleShooting

- 1. TROUBLE:** Synchro AOA values fluctuate and do not change per the scaling defined in the ICD.
PROBABLE CAUSE: Incorrect AOA vane used or faulty “Z” leg connection (bad ground or corrosion).
- 2. TROUBLE:** A/C installation uses course/fine 3-wire Corrected Barometric Altitude Synchro interface and EGPWS Terrain Display jumps altitudes and EGPWS illuminates Terrain INOP intermittently with a Level 2 Self Test message of Baro Alt Rate Fault.
PROBABLE CAUSE: Course and fine 3-wire synchros cross-wired such that course synchro wires are connected to the fine inputs and the fine wires are connected to the course inputs.
CORRECTIVE ACTION: Correct wire error.
- 3. TROUBLE:** No EGPWS Self Test audio. Lamps and Terrain Display operate correctly.
PROBABLE CAUSE: 8-Ohm audio signal Low wire is improperly connected to the EGPWS.
CORRECTIVE ACTION: Disconnect 8-Ohm audio signal Low wire from the EGPWS and connect to the nearest Chassis ground closest to the speaker.
- 4. TROUBLE:** EGPWS installation uses LED Switchlamps that are connected to the aircraft’s Master dim & Test circuit. Master Test is OK, but LEDs fail to illuminate when set to DIM.
PROBABLE CAUSE: LED’s are not receiving a minimum of 13 Vdc Dim Voltage (some aircraft use 9 Vdc Dim voltage).
CORRECTIVE ACTION: Connect switchlamps to Dim circuit providing a minimum of 13 Vdc.
- 5. TROUBLE:** At initial turn on, the red Computer Fail light is illuminated. What now? Return the box?
PROBABLE CAUSE: Past experience has shown that most of the time incorrect strapping is to blame for the illumination of the Computer Fail indication, not an internal EGPWS failure.
CORRECTIVE ACTION: Check the unit on a bench. Ground the parity program pin (PP5, J2-B9), and apply the correct power (115 VAC or 28 VDC) to the appropriate input power pins. If the green Computer OK lamp illuminates, the problem is in the strapping. Double check the continuity of the strapping and check for Level 2 Self-Test messages that indicate program pin errors. Call the Avionics Technical Assistance (1-877-436-2005) for assistance in troubleshooting strapping errors.
- 6. TROUBLE:** Self-Test Level 2 reports Bus Inactive or signal UPD faults? What causes that?
PROBABLE CAUSE: Most commonly UPD (ARINC 429 update rate) faults occur when the input bus speed (high or low) is the opposite of what the EGPWS requires.
CORRECTIVE ACTION: Occasionally, the transmitting equipment needs to be modified to meet the minimum required ARINC 429 label transmission rate. Bus Inactive faults can be caused by crossed wires, incorrect bus speed, or connection to unpowered equipment.
- 7. TROUBLE:** Self-Test Level 2 reports Mode 6 Inop and Digital DH Inop. What causes that?
PROBABLE CAUSE: If an Altitude Callout menu containing the word “Approaching”, “Plus” or “Above” is strapped, but the aircraft has no ARINC 429 Decision Height input, these messages will occur. (Fixed in –214-214 software).
CORRECTIVE ACTION: Re-strap to select an Altitude Callout menu that does NOT contain the words “Approaching”, “Plus” or “Above”.

6.3 NOTES

1. **IMPORTANT NOTE:** Always read the notes and configuration information at the beginning of each Aircraft Configuration Category (e.g. Sections 5.1 through 5.2.17 of the ICD). These provide valuable information on options and notes on what possible bus conflicts may arise.

2. **8-Ohm Speaker ground.**

The 8-Ohm speaker **LOW** must be connected to aircraft DC ground and not J1B-6 or J1B-14 on the EGPWS, preferably *closest* to the speaker.

3. **IMPORTANT NOTE:** Cockpit lamp resistance.

In order to ensure that the EGPWS Program Pin Strapping operates correctly, the “cold” filament resistance of all lights in each lamp circuit must be greater than 15 Ohms.

EXAMPLE: The aircraft has two PULL UP lamp assemblies in parallel (one lamp assembly for the Captain and one lamp assembly for the F/O). Each lamp assembly has two parallel lamps. Total circuit has four parallel lamps. Total resistance of the four lamps (when cold) must be greater than 15 Ohms.

4. **Single Display with ARINC 429 range.**

If the installation is using only a single display with range data input over an ARINC 429 bus, the ARINC 429 bus must be connected to **both** range bus inputs. If not, a range bus fault will be detected by the EGPWS and will be annunciated in Self Test Level 2 and the EGPWS Front Panel External Fault LED will be illuminated.

EXAMPLE: The aircraft is using a single display. The display ID Type is 22, Collins WXI-711 PPI. The ARINC 429 range bus input (as defined in ICD Section 5.2.7) must be connected to J2-C13/C14 and J2-B14/B15.

5. **Use of Internal Mag Var table to create True Heading. (Fixed in TDB 425 and on).**

If the aircraft installation is using Magnetic Heading **and** the internal EGPWS Mag Var table to create True Heading (e.g. there is no other source of True Heading for the EGPWS), then the EGPWS Terrain Display will become unavailable for operations beyond 70° North and 60° South latitudes. If the Terrain Display is selected as the aircraft exceeds these latitude limits, the Terrain Display will be deselected after 4 seconds and the TERR annunciators will extinguish. The EGPWS Terrain/Obstacle Awareness Alerting and Terrain Clearance Floor alerting functions will remain active.

6. **Program Pin Strapping.**

Each Program Pin (PPCNFX) can be connected to read **only** one State (e.g. open, connected to PPCOM or only one of the Discrete Outputs).

Each output discrete or PPCOM may be connected to multiple Program Pins.

If a Program Pin is connected to more than one state, the EGPWS INOP condition will result.

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7. Air Data interfaces without Corrected Barometric Altitude requires the use of GPS altitude for Terrain Awareness Alerting and Display and Terrain Clearance Floor.

Air data interfaces (ID Types 7, 17, 24, 25, 27) do not support Corrected Barometric Altitude. Use of these ID Types **require** the use of GPS with GPS altitude as a position source.

Refer to the Line Maintenance Manual, 060-4199-180, for information on troubleshooting an installation or call Honeywell for assistance.

Avionics Technical Assistance 1-877-436-2005

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7.0 Acronyms

A	Amps
A/C	Aircraft
AC	Alternating Current
ADC	Air Data Computer
ADIRU	Air Data Inertial Reference Unit
AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AGL	Above Ground Level
AHRS	Attitude Heading Reference System
AIMS	Airplane Information Management System
ALT	Altitude
ALT	Alternate
AOA	Angle of Attack
ARINC	Aeronautical Radio, Incorporated
AT	Air Transport
BA	Bank Angle
Bizjet	Business Jet or General Aviation aircraft
CAS	Computed Air Speed
CFDS	Centralized Fault Display system
CFIT	Controlled Flight Into Terrain
CFM	Cubic Feet per Minute
CMC	Central Maintenance Computer
DAA	Digital/Analog Adapter
DAU	Data Acquisition Unit
dB	decibels
DC	Direct Current
DCP	Display Control Panel
DEU	Display Electronics Unit
DGAC	Director Generale de l'Aviation Civile (French certifying authority equivalent of FAA)
DH	Decision Height
DSWC	Digital Stall Warning Computer
ECAM	Electronic Centralized Aircraft Monitoring
EFIS	Electronic Flight Instrument System
EGPWC	Enhanced Ground Proximity Warning Computer
EGPWS	Enhanced Ground Proximity Warning System
EICAS	Engine Indication and Crew Alerting System
FAA	Federal Aviation Administration
FCC	Flight Control Computer
FDAU	Flight Data Acquisition Unit
FDR	Flight Data Recorder
FMC	Flight Management Computer
FMS	Flight Management System
FWC	Fault Warning Computer
GA	General Aviation
GP	General Purpose
GPIRS	Global Positioning/Inertial Reference System
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
G/S	Glideslope
HDOP	Horizontal Dilution of Position
HFOM	Horizontal Figure of Merit
Hz	Hertz
IC	Integrated Circuit
ICD	Interface Control Document

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ILS	Instrument Landing System
INOP	Inoperable
IRS	Inertial Reference System
LRRA	Low Range Radio Altimeter
LRU	Line Replacement Unit
MCP	Mode Control Panel
MCU	Modular Component Unit
MFD	Multi-Function Display
MLS	Microwave Landing System
mW	milliwatts
P/TEST	Push to Test
PC	Personal Computer
pF	picoFarad
PFD	Primary Flight Display
PPIN	Program Pin
PWS	Predictive Windshear System
QFE	Corrected Barometric Altitude Relative to Field Elevation
QNH	Corrected Barometric Altitude Relative to Mean Sea Level
R ALT	Radio Altitude
RAAS	Runway Awareness and Alerting System
R/T	Receiver/Transmitter
RA	Radio Altitude
RAAS	Runway Awareness and Alerting System
RAIM	Receiver Autonomous Integrity Monitoring
SB	Service Bulletin
SMYD	Stall Margin Yaw Damper
SPS	Stall Protection System
SSM	Sign/Status Matrix
STC	Supplemental Type Certificate
SWC	Stall Warning Computer
TAD	Terrain Awareness Display
TC	Type Certification
TCAS	Terrain Collision Avoidance System
TCAS	Terrain Collision Avoidance System
TCF	Terrain Clearance Floor
UDI	Universal Display Interface
V	Volts
VDOP	Vertical Dilution of Position
VFOM	Vertical Figure of Merit
VIA	Versatile Integrated Avionics
W	Watt
W/S	Windshear
Wx	Weather
WXR	Weather Radar

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SECTION VIII – PIN TO PIN COMPARISON

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8.1 MK II GPWS (CLASSIC) TO MK VII EGPWS (ENHANCED) SIGNAL MAPPING 106

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8.1 MK II GPWS (Classic) to MK VII EGPWS (Enhanced) Signal Mapping

Rear Connector Pin-Out Sorted By Pin Number (*USE FOR REFERENCE ONLY*)

√=Indicates same function

shaded area indicates function change

<i>Signal Name -MK-II GPWS (965-0476-088)</i>	<i>Signal Type</i>	<i>Same</i>	<i>Conn/Pin</i>	<i>Signal Type</i> ←IN Out→	<i>Signal Name -MK-VII EGPWS (Enhanced)</i>
Mode 6 Low Volume-control (Ground)	Disc	√	J1A-01	←GDisc	Mode 6 Low Volume Discrete (Ground)
SPARE	Reserved		J1A-02	←GDisc	Steep Approach Discrete #1 (Ground)
GS enable or ILS Freq Select (Ground)	Disc	√	J1A-03	←GDisc	ILS Tuned Discrete #1 (Ground)
Alternate GS audio select (Reserved)	Reserved		J1A-04	←28vDisc	Radio Altitude Validity Discrete #2 (+28VDC)
GS Mode Inhibit or ILS BC (Gnd)	Disc	√	J1A-05	←GDisc	Glideslope Inhibit Discrete (Gnd)
SPARE	Reserved		J1A-06	PLI 1	Pitch Limit Indicator 1
Baro rate wiring monitor (Reserved)	Reserved		J1A-07	PLI 2	Pitch Limit Indicator 2
Baro Alt Fine Synchro: ARINC 545A/565 (X)	Synchro	√	J1A-08	←AC Analog3W1	Baro Alt Fine Synchro: ARINC 545A/565 (X)
Baro Alt Fine Synchro: ARINC 545A/565 (Y)	Synchro	√	J1A-09	←AC Analog3W2	Baro Alt Fine Synchro: ARINC 545A/565 (Y)
Baro Alt Fine Synchro: ARINC 545A/565 (Z)	Synchro	√	J1A-10	←AC Analog3W3	Baro Alt Fine Synchro: ARINC 545A/565 (Z)
KIFIS alt select (Reserved)	Reserved		J1A-11	←429 (A)	429 input 4(A) Data Concentrator
KIFIS Altitude Synchro Valid (Reserved)	Reserved		J1A-12	←429 (B)	429 input 4(B) Data Concentrator
FLASHING GPWS Warn Lamp	Output		J1A-13	Lampout-5→	Wx/EGPWC Display Select Discrete#1 (DO#5)
Flap Discrete Reversal	Progpín		J1A-14	←Prog Pin-10	Program Pin, PP10
KIFIS Fine Synchro Altitude Ref- (H) (Reserved)	Reserved		J1A-15	453 Out (A)→	453 output 1(A) (Terr Display Data #1)
Fine Synchro Altitude Ref- (L)	Reserved		J1A-16	453 Out (B)→	453 output 1(B) (Terr Display Data #1)
ARINC 575 DADS (A) (Reserved)	Reserved		J1A-17	←429 Input (A)	429 Input 5(A) INS/FMS 1
ISDAS Serial Decision Height (A)	Reserved		J1A-18	←429 Input (B)	429 Input 5(B) INS/FMS 1
ARINC 575 DADS (B) (Reserved)	Reserved		J1A-18	←429 Input (B)	429 Input 5(B) INS/FMS 1
Glideslope 1 Validity - Low Level (+)	DC-AnalogH	√	J1A-19	←Analog (+)	Glideslope 1 Validity - Low Level (+)
Glideslope 1 Validity - Low Level (-)	DC-AnalogL	√	J1A-20	←Analog (-)	Glideslope 1 Validity - Low Level (-)
SPARE	Reserved		J1A-21	Lampout-6→	Glideslope Manually Canceled Discrete (DO#6)
GS-High Level (Arinc578 (+))	DC-Analog		J1A-22	←429 Input (A)	429 input 6(A) GPS 1
GS-High Level (Arinc578 (-))	DC-Analog		J1A-23	←429 Input (B)	429 input 6(B) GPS 1
Landing Flaps Position (+28VDC)	Discrete	√	J1A-24	←28vdisc	Landing Flaps Discrete (+28VDC)

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<i>Signal Name –MK-II GPWS (965-0476-088)</i>	<i>Signal Type</i>	<i>Same</i>	<i>Conn/Pin</i>	<i>Signal Type</i> ←IN Out→	<i>Signal Name -MK-VII EGPWS (Enhanced)</i>
Radio Altitude DH (Ground)	Discrete	√	J1A-25	←Gdisc	DH Discrete (Ground)
Program Pin Common	PWR/GND	√	J1A-26	←GND__PP	Program Pin Common
Audio Output Level Program (Reserved)	Reserved		J1A-27	←Progpin-11	Program Pin PP11
Extended Audio Output Level Program (Reserved)	Reserved		J1A-28	←Progpin-12	Program Pin PP12
Alternate Mode 4B Select	Progpin		J1A-29	←Progpin-13	Program Pin PP13
Warning Computer Power Output (+)	PWR/GND	√	J1A-30	PWROUT (+)→	Warning Computer Power Output (+)
Warning Computer Power Output (-)	PWR/GND	√	J1A-31	PWROUTL (-)→	Warning Computer Power Output (-)
Alt Radio Altitude Scale Factor Select	Progpin		J1A-32	←Progpin-14	Program Pin PP14
High Level Direct Speaker Drive - 8Ω	Output	√	J1A-33	HL Audio Out (H)→	High Level Direct Speaker Drive - 8Ω
SPARE	Reserved		J1A-34	←Progpin-15	Program Pin PP15
SPARE	Reserved		J1A-35	←Progpin-16	Program Pin PP16
Mach/CAS Synchro: ARINC 545A/565 (X)	Synchro	√	J1A-36	←AC Analog3W1	CAS Synchro: ARINC 545A/565 (X)
Mach/CAS Synchro: ARINC 545A/565 (Y)	Synchro	√	J1A-37	←AC Analog3W2	CAS Synchro: ARINC 545A/565 (Y)
Mach/CAS Synchro: ARINC 545A/565 (Z)	Synchro	√	J1A-38	←AC Analog3W3	CAS Synchro: ARINC 545A/565 (Z)
DC Airspeed: ARINC 575 (+))	DC AnalogH	√	J1A-39	←DC Analog (+)	DC Airspeed (+)
DC Airspeed: ARINC 575 (-)	DC AnalogL	√	J1A-40	←DC Analog (-)	DC Airspeed (-)
Glideslope Enable or ILS Freq Selected (+28VDC)	Discrete	√	J1B-01	←28vdisc	ILS 1 Tuned (+28VDC)
Glideslope Mode Inhibit or ILS Back Course (+28VDC)	Discrete	√	J1B-02	←28vdisc	Glideslope Inhibit Discrete (+28VDC)
AC Power Input 115 VAC 400 Hz (H)	PWR/GND	√	J1B-03	←PWRH	AC Power Input 115 VAC 400 Hz (H)
AC Power Input 115 VAC 400 Hz (C)	PWR/GND	√	J1B-04	←PWRL	AC Power Input 115 VAC 400 Hz (C)
Chassis Ground	GND	√	J1B-05	←GND__C	Chassis Ground
Signal Ground (DC)	GND	√	J1B-06	←GND__S	Signal Ground
Landing Gear Position (+28VDC)	Discrete	√	J1B-07	←28vdisc	Landing Gear Discrete (+28VDC)
Audio Output Suppress Activation (+28V)	Discrete	√	J1B-08	←28vdisc	Audio Inhibit Discrete (+28V)
GPWS Warning Lamp No. 2	Output		J1B-09	Lampout-7→	Terrain Displayable #1 (DO#7) (to Terr lamp)
Special Purpose GPWS Warning Discrete	Output		J1B-10	Lampout-8→	Terrain Displayable #2 (DO#8) (to Terr lamp)
GPWS Warning Lamp No. 1	Output	√	J1B-11	Lampout-9→	GPWS Warning Discrete (DO#9) (to red GPWS or Pull Lamp)
GPWS INOP Lamp	Output	√	J1B-12	Monitor Out→	GPWS INOP discrete (monitor) (to GPWS Fail/Inop lamp)
Low Level Inter phone Audio No. 1 (H)	Output	√	J1B-13	LLAud Out (H)→	Low Level Inter phone Audio No. 1 (H)
Low Level Inter phone Audio No. 1 (C)	Output	√	J1B-14	LLAud Out (L)→	Low Level Inter phone Audio No. 1 (C)
Alternate High Level Audio (Reserved)	Reserved		J1B-15	←GDisc	Flap Position Discrete #3 (Gnd)

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<i>Signal Name –MK-II GPWS (965-0476-088)</i>	<i>Signal Type</i>	<i>Same</i>	<i>Conn/Pin</i>	<i>Signal Type</i> ←IN Out→	<i>Signal Name -MK-VII EGPWS (Enhanced)</i>
All Modes Inhibit (Ground)	Discrete		J1B-16	←GDisc	Aud Inhibit Discrete/Mom Aud Supp Disc (GND) (Gnd)
Low Level Inter phone Audio No. 2 (H)	Output	√	J1B-17	LLAud Out (H)→	Low Level phone Audio No. 2 (H)
Low Level Inter phone Audio No. 2 (C)	Output	√	J1B-18	LLAud Out (L)→	Low Level phone Audio No. 2 (C)
Radio Altimeter Validity (+28VDC)	28vDisc	√	J1B-19	←28vDisc	Radio Altitude Validity Discrete #1 (+28VDC)
Radio Altitude: ARINC 552 (+)	DC Analog	√	J1B-20	←S_Radio (+)	Radio Altitude 1: ARINC 552/ALT-55 (+)
Radio Altitude: ARINC 552 (-)	DC Analog AnalogS_RadioL	√	J1B-21	←S_Radio (-)	Radio Altitude 1: ARINC 552/ALT-55 (-)
Self Test Initiation (Ground)	Discrete	√	J1B-22	←GDisc	Self Test Discrete (Ground) (from GPWS PTT Sw)
Landing Gear Position (Ground)	Discrete	√	J1B-23	←GDisc	Landing Gear Discrete (Ground)
Landing Flaps Position (Ground)	Discrete	√	J1B-24	←GDisc	Landing Flaps Discrete (Ground) (Flaps OVRD) SW)
GPWS Discrete No. 3	Discrete		J1B-25	←GDisc	Flap Position Discrete #1 (Gnd)
Glideslope Validity (+28VDC)	Discrete	√	J1B-26	←28vDisc	Glideslope Validity Discrete #1 (+28VDC)
Barorate/Barometric Altitude Validity (+28V)	Discrete	√	J1B-27	←28vDisc	Barorate/Barometric Alt 1 Validity (+28V)
DC Barorate #1: ARINC 575/595 (Sig)	DC Analog	√	J1B-28	←S_DCBaro1 (Sig)	DC Barorate #1: 595 (Sig)
DC Barorate #1: ARINC 575/595 (+Ref)	DC Analog	√	J1B-29	←S_DCBaro2 (+Ref)	DC Barorate #1: 595 (+Ref)
DC Barorate #1: ARINC 575/595 (-Ref)	DC Analog	√	J1B-30	←S_DCBaro3 Ref)	DC Barorate #1: 595 (-Ref)
Glideslope 1 Deviation - Low Level (+ up)	DC Analog	√	J1B-31	←S_Glide (+)	Glideslope 1 Dev - Low Level (+up) (GS+DN)
Glideslope 1 Deviation - Low Level (+ down)	DC Analog	√	J1B-32	←S_Glide (-)	Glideslope 1 Dev - Low Level (+down) (GS+UP)
Glideslope Alert Lamp	Output	√	J1B-33	Lampout-10→	Glideslope Alert Disc. (DO#10) (to BLW GS lamp)
Glideslope Mode Manual Inhibit (Cancel) (Ground)	Discrete	√	J1B-34	←GDisc	Glideslope Cancel Dis. (Gnd) (from GS Cancel SW)
Auxiliary AC Barometric Rate (H)	AC Analog		J1B-35	453 out (A)→	453 output 2(A) (Terr Display Data #2)
Auxiliary AC Barometric Rate (C)	AC Analog		J1B-36	453 out (B)→	453 output 2(B) (Terr Display Data #2)
AC Barorate #1: ARINC 545A/565 (H)	AC Analog	√	J1B-37	←AC Analog (H)	AC Barorate #1: ARINC 545A/565 (H)
AC Barorate #1: ARINC 545A/565 (L)	AC Analog	√	J1B-38	←AC Analog (L)	AC Barorate #1: ARINC 545A/565 (L)
AC Barorate #1 Reference (H)	AC Analog	√	J1B-39	←AC Analog(H)	AC Barorate #1 Reference (H) (ref)
AC Barorate #1 Reference (L)	AC Analog	√	J1B-40	←AC Analog (L)	AC Barorate #1 Reference (L) (ref)
NEW CONNECTOR					
			J2-A01	Lampout-1→	Windshear Caution Dis. (DO#1) (to WS Caut lamp)
			J2-A02	Lampout-2→	Windshear Warning Disc. (DO#2) (to WS Warn lamp)
			J2-A03	Monitor Out→	Windshear INOP Disc. (Monitor) (to WS Inop Lamp)

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			J2-A04	RS232-1→	Digital RS232 Port (Common)
			J2-A05	RS232-2→	Digital RS232 Port (Transmit)
			J2-A06	RS232-3→	Digital RS232 Port (Receive)
			J2-A07	←Prog-pin-20	Program Pin PP20
			J2-A08	←Prog-pin-21	Program Pin PP21
			J2-A09	←Prog-pin-22	Program Pin PP22
			J2-A10	←Prog-pin-6	Program Pin PP6
			J2-A11	←Prog-pin-23	Program Pin PP23
			J2-A12	←Prog-pin-7	Program Pin PP7
			J2-A13	←Prog-pin-24	Program Pin PP24
			J2-A14	←Prog-pin-8	Program Pin PP8
			J2-A15	←Prog-pin-9	Program Pin PP9
NEW CONNECTOR					
			J2-B01	←Prog-pin-17	Program Pin PP17
			J2-B02	←Prog-pin-1	Program Pin PP1
			J2-B03	←Prog-pin-18	Program Pin PP18
			J2-B04	←Prog-pin-2	Program Pin PP2
			J2-B05	←Prog-pin-19	Program Pin PP19
			J2-B06	←Prog-pin-3	Program Pin PP3
			J2-B07	←Prog-pin-4	Program Pin PP4 (spare ppin)
			J2-B08	←GND_S	+5 VDC Ground (Redundant to J1B-6)
			J2-B09	←Prog-pin-5	Program Pin PP5 (spare ppin)
			J2-B10	←28vDisc	Radio Altitude Validity Discrete #3 (+28VDC)
			J2-B11	←S_Radio (+)	Radio Altitude 3: ARINC 552/ALT-55 (+)
			J2-B12	←S_Radio (-)	Radio Altitude 3: ARINC 552/ALT-55 (-)
			J2-B13	Lampout-4→	TCAS Inhibit (Audio Inhibit) discrete (DO#4)
			J2-B14	←429 input (A) ←422 input (A)	429 in 17 (A) Display Control Bus 2 (Range Input-1) RS-422 #1 (A) Display Control Bus 2 (Range Input-1)
			J2-B15	←429 input (B) ←422 input (B)	429 in 17(B)Display Control Bus 2 (Range Input-1) RS-422 #1(B) Display Control Bus 2 (Range Input-1)

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NEW CONNECTOR					
			J2-C01	← Analog3W1	DC Ratio Angle of Attack (+) DC Angle of Attack #2 (+) Synchro Angle of Attack #2 (Y)
			J2-C02	← Analog3W2	Synchro Angle of Attack #2 (X)
			J2-C03	← Analog3W3	DC Ratio Angle of Attack (-) DC Angle of Attack #2 (-) Synchro Angle of Attack #2 (Z)
			J2-C04	← Gdisc	Simulator Reposition Discrete
			J2-C05	← 28vdisc	Barometric Alt Rate #2 Validity (+28V)
			J2-C06	← 429/575 in (A)	429/575 input 1(A) Digital Air Data 2
			J2-C07	← 429/575 in (B)	429/575 input 1(B) Digital Air Data 2
			J2-C08	← 429 (A)	429 input 2(A) INS/FMS 2
			J2-C09	← 429 (B)	429 input 2 (B) INS/FMS 2
			J2-C10	429 (TX) out (A)→	429 output 1(A) (to EFIS SGs)
			J2-C11	429 (TX) out (B)→	429 output 1(B) (to EFIS SGs)
			J2-C12	← S_TATRET	DC Ratio Total Air Temp. (TAT): Excitation Return
			J2-C13	← 429 input (A) 422 output (A)→	429 in 16(A) Display Control Bus 1 (Range-1 input) RS-422 #1TX (A) Display Control Bus 1 (output)
			J2-C14	← 429 input (B) 422Txin (B)→	429 in 16(B) Display Control Bus 1 (Range-1 input) RS-422 #1 TX (B) Display Control Bus 1 (output)
			J2-C15	← Gdisc	Flap Position Discrete #2 (Gnd)
NEW CONNECTOR					
			J2-D01	← Analog3W1	Synchro Flap Position #2 (Y) DC Selsyn Flap Position #2 (Y)
			J2-D02	← Analog3W2	Synchro Flap Position #2 (X) DC Selsyn Flap Position #2 (X)
			J2-D03	← Analog3W3	Synchro Flap Position #2 (Z) DC Selsyn Flap Position #2 (Z)
			J2-D04	← 28vdisc	Attitude #2 Validity (+28V)
			J2-D05	← Gdisc	WXR On Discrete #2 (Gnd)
			J2-D06	← Analog (+)	Calibrated IAS DC (Simulator) (+) (ref) DC Flap Angle (+)
			J2-D07	← Analog (-)	Calibrated IAS DC (Simulator) (-) (ref) DC Flap Angle (-)
			J2-D08	← AC Analog3W1	Fine Barometric Altitude #2 (Y)
			J2-D09	← AC Analog3W2	Fine Barometric Altitude #2 (X)
			J2-D10	← AC Analog3W3	Fine Barometric Altitude #2 (Z)
			J2-D11	← 28vdisc	Accel Valid Long (28V)

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			J2-D12	←28vdisc	Accel Self Test in Progress (28v)
			J2-D13	←AC Analog3W1	Pitch Attitude #2 (Y)
			J2-D14	←ACAnalog3W2	Pitch Attitude #2 (X)
			J2-D15	←AC Analog3W3	Pitch Attitude #2 (Z)
NEW CONNECTOR					
			J2-E01	←AC Analog3W1	Roll Attitude #2 (Y)
			J2-E02	←AC Analog3W2	Roll Attitude #2 (X)
			J2-E03	←AC Analog3W3	Roll Attitude #2 (Z)
			J2-E04	← Analog (+)	Normal Acceleration #2 (+) ± 9 vdc AOA (safeflight) for HS 125-800 (+)
			J2-E05	← Analog (-)	Normal Acceleration #2 (-) ± 9 vdc AOA (safeflight) for HS 125-800 (-)
			J2-E06	← Analog (+)	Longitudinal Acceleration #2 (+) (ref) SAT (absolute DC) (+) Coarse Altitude DC (Simulator, AZ-241) (+)
			J2-E07	← Analog (-)	Longitudinal Acceleration #2 (-) (ref) SAT (Absolute DC) (-) Coarse Altitude DC (Simulator, AZ-241) (-)
			J2-E08	←AC Analog (H)	AC Flap Position Excitation #2 (H) (ref)
			J2-E09	←AC Analog (L)	AC Flap Position Excitation #2 (C) (ref)
			J2-E10	←GND_PP	Program Pin Common (Redundant to J1A-26)
			J2-E11	←GDisc	Flap Position Discrete #4 (Gnd)
			J2-E12	←28Vdcdisc	AOA Vane #2 Validity (+28VDC)
			J2-E13	←GDisc	Steep Approach Discrete #2 (Ground)
			J2-E14	←Gdisc	WXR On Discrete #1 (Ground)
			J2-E15	←28vdisc	Localizer Validity Discrete #1 (+28VDC)
NEW CONNECTOR					
			J2-F01	(Monitor output)→	Terrain Display INOP Disc. (Monitor) (to TERR Inop Lamp)
			J2-F02	Lampout-3→	Wx/EGPWC Disp. Sel Disc #2 (DO#3) (to relay)
			J2-F03	spare	spare
			J2-F04	←Gdisc	Altitude Callouts Enable Discrete
			J2-F05	←S_DCAOA (+)	Special DC AOA #2 Input (+)
			J2-F06	←S_DCAOA (-)	Special DC AOA #2 Input (-)
			J2-F07	←Gdisc	Display Select Discrete #1 (from Momentary Sw)
			J2-F08	←S_Radio (+)	Radio Altitude 2: ARINC 552/ALT-55 (+)
			J2-F09	←S_Radio (-)	Radio Altitude 2: ARINC 552/ALT-55 (-)
			J2-F10	←S_Glide (+up)	Glideslope 2 Dev - Low Level (+ up) (GS+DN)
			J2-F11	←S_Glide (+down)	Glideslope 2 Dev - Low Level (+ down) (GS+UP)

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			J2-F12	←28vdisc	ILS 2 Tuned(+28VDC)
			J2-F13	←GDisc	ILS Tuned Discrete #2 (Ground)
			J2-F14	←Analog (+)	Glideslope 2 Validity - Low Level (+)
			J2-F15	←Analog (-)	Glideslope 2 Validity - Low Level (-)
NEW CONNECTOR					
			J2-G01	←28vdisc	AOA #1 Validity Discrete (+28V)
			J2-G02	←28vDisc	Glideslope Validity Discrete #2 (+28VDC)
			J2-G03	←28vdisc	Accel Valid Norm (+28V)
			J2-G04	←GDisc	Terrain Awareness & TCF Inhibit (Ground) (from TERR OVRD switch)
			J2-G05	←28vdisc	Airspeed Validity (+28V)
			J2-G06	←5Vref+	A/D Converter Reference Voltage (+) Alpha Vane Excitation DC Ratio Total Air Temp. (TAT) Excitation
			J2-G07	←5Vref-	Analog to Digital Converter Reference Voltage (-)
			J2-G08	T_refH	AC zero cross timing reference 1H
			J2-G09	T_refL	AC zero cross timing reference 1L
			J2-G10	T_refH	AC zero cross timing reference 2H
			J2-G11	T_refL	AC zero cross timing reference 2L
			J2-G12	←AnalogH	spare analog
			J2-G13	←AnalogL	spare analog
			J2-G14	←AnalogH	AC Flap Position Excitation #1 (H) (ref)
			J2-G15	←AnalogL	AC Flap Position Excitation #1 (L) (ref)
NEW CONNECTOR					
			J2-H01	←Analog3W1	DC Angle of Attack #1 (+) Sync AOA #1 (X)
			J2-H02	←Analog3W2	Sync AOA #1 (Y)
			J2-H03	←Analog3W3	Synchro Angle of Attack #1 (Z) DC Angle of Attack #1 (-)
			J2-H04	←S_Localizer (+)	Localizer #1 Deviation - Low Level (+) (Loc+LF)
			J2-H05	←S_Localizer (-)	Localizer #1 Deviation - Low Level (-) (Loc+RT)
			J2-H06	←Analog3W1	AC Baro Alt Coarse Synchro (X) DC Baro Altitude (+)
			J2-H07	←Analog3W2	AC Baro Alt Coarse Synchro (Y)
			J2-H08	←Analog3W3	AC Baro Alt Coarse Synchro (Z) DC Baro Altitude (-)
			J2-H09	←Gdisc	Display Select Disc. #2 (from TERR momentary switch)
			J2-H10	←Analog (H)	Spare

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			J2-H11	← Analog (L)	Spare
			J2-H12	← Analog (+)	Norm Accel #1: Bi-Axial Accelerometer (+)
			J2-H13	← Analog (-)	Norm Accel #1: Bi-Axial Accelerometer (-)
			J2-H14	← Analog (+)	Long Accel #1: Bi-Axial Accelerometer (+)
			J2-H15	← Analog (-)	Long Accel #1: Bi-Axial Accelerometer (-)
NEW CONNECTOR					
			J2-J01	← Analog3W1	spare 3 wire analog 1
			J2-J02	← Analog3W2	spare 3 wire analog 2
			J2-J03	← Analog3W3	spare 3 wire analog 3
			J2-J04	← Analog (+)	DC Ratio Static Air Temperature (SAT) (+) DC Static Air Temperature (SAT) (+) DC Ratio Total Air Temperature (TAT) (R _{tat+})
			J2-J05	← Analog (-)	DC Ratio Static Air Temperature (SAT) (-) DC Static Air Temperature (SAT) (-) DC Ratio Total Air Temperature (TAT) (R _{tat-})
			J2-J06	← Analog H	DC Ratio Static Air Temp (SAT) (REF-) DC Ratio Total Air Temp (TAT) (R _{ref+})
			J2-J07	← Analog L	DC Ratio Static Air Temp (SAT) (REF+) DC Ratio Total Air Temp (TAT) (R _{ref-})
			J2-J08	← AC Analog3W1	Spare Synchro #1 (X) (magnetic Track?)
			J2-J09	← AC Analog3W2	Spare Synchro #1 (Y)
			J2-J10	AC Analog3W3	Spare Synchro #1 (Z)
			J2-J11	← S_Localizer (+lf)	Localizer #2 Deviation - Low Level (+)
			J2-J12	← S_Localizer (+rt)	Localizer #2 Deviation - Low Level (-)
			J2-J13	← Analog3W1	Synchro Flap Position #1 (X) DC Selsyn Flap Position #1 DC Flap Angle (+)
			J2-J14	← Analog3W2	Synchro Flap Position #1 (Y) DC Selsyn Flap Position #1 (Y)
			J2-J15	← Analog3W3	Synchro Flap Position #1 (Z) DC Selsyn Flap Position #1 (Z) DC Flap Angle (-)
NEW CONNECTOR					
			J2-K01	← AC Analog3W1	Synchro Pitch Attitude #1 (X)
			J2-K02	← AC Analog3W2	Synchro Pitch Attitude #1 (Y)
			J2-K03	← AC Analog3W3	Synchro Pitch Attitude #1 (Z)
			J2-K04	← Analog (Sig+)	AC Ratio Barometric Altitude Rate #2 (Signal+)
			J2-K05	← Analog (Sig-)	AC Ratio Barometric Altitude Rate #2 (Signal-)
			J2-K06	← Analog (Ref+)	AC Ratio Barometric Altitude Rate #2 (ref)

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			J2-K07	←Analog (Ref-)	AC Ratio Barometric Altitude Rate #2 (ref)
			J2-K08	←429 (A)	429/575 input 3(A) Digital Air Data 1
			J2-K09	←429 (B)	429/575 input 3(B) Digital Air Data 1
			J2-K10	Accel_out→	Accelerometer Self Test initialization Output
			J2-K11	←28vdisc	Attitude #1 Validity (+28V)
			J2-K12	←28vdisc	Localizer Validity Discrete #2 (+28VDC)
			J2-K13	←AC Analog3W1	Roll Attitude #1 (X)
			J2-K14	←AC Analog3W2	Roll Attitude #1 (Y)
			J2-K15	←AC Analog3W3	Roll Attitude #1 (Z)

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8.2 MK VII GPWS (Classic) to MK VII EGPWS (Enhanced) Signal Mapping

Rear Connector Pin-Out Sorted By Pin Number (USE FOR REFERENCE ONLY)

√=Indicates same function

shaded area indicates function change

Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
Mode 6 Low Volume-control (Ground)	Disc	√	J1A-01	←GDisc	Mode 6 Low Volume Discrete (Ground)
Steep App switch (Ground) Conn to J2-G2 (-04 only)	Disc	√	J1A-02	←GDisc	Steep Approach Discrete #1 (Ground)
GS enable or ILS Freq Select (Ground)	Disc	√	J1A-03	←GDisc	ILS Tuned Discrete #1 (Ground)
Alternate GS audio select	Reserved		J1A-04	←28vDisc	Radio Altitude Validity Discrete #2 (+28VDC)
GS Mode Inhibit or ILS BackCourse (Gnd)	Disc	√	J1A-05	←GDisc	Glideslope Inhibit Discrete (Gnd)
Alternate Mode 3 Warn	Reserved		J1A-06	PLI 1	Pitch Limit Indicator 1
Baro rate wiring monitor	Reserved		J1A-07	PLI 2	Pitch Limit Indicator 2
Baro Alt Fine Synchro: ARINC 545A/565 (X)	Synchro	√	J1A-08	←AC Analog3W1	Baro Alt Fine Synchro: ARINC 545A/565 (X)
Baro Alt Fine Synchro: ARINC 545A/565 (Y)					
Synchro		√	J1A-10	←AC Analog3W3	Baro Alt Fine Synchro: ARINC 545A/565 (Z)
KIFIS alt select	Reserved		J1A-11	←429 (A)	429 input 4(A) Data Concentrator
Altitude Synchro Valid	Reserved		J1A-12	←429 (B)	429 input 4(B) Data Concentrator
GPWS Warn Lamp 3	output		J1A-13	Lampout-5→	Wx/EGPWC Display Select Discrete#1 (DO#5)
Flap Discrete Reversal	Progpín		J1A-14	←Prog Pin-10	Program Pin, PP10
Fine Synchro Altitude Ref- (H)	Reserved		J1A-15	453 Out (A)→	453 output 1(A) (Terrain Display Data #1)
Fine Synchro Altitude Ref- (L)	Reserved		J1A-16	453 Out (B)→	453 output 1(B) (Terrain Display Data #1)
IRS/INS/FMS Inertial Data #1- ARINC 429 (A)	Serial		J1A-17	←429 Input (A)	429 Input 5(A) INS/FMS 1
IRS/INS/FMS Inertial Data #1- ARINC 429 (A) ISDAS Serial Decision Height (A)	Serial		J1A-18	←429 Input (B)	429 Input 5(B) INS/FMS 1
Glideslope 1 Validity - Low Level (+)	DC-AnalogH	√	J1A-19	←Analog (+)	Glideslope 1 Validity - Low Level (+)
Glideslope 1 Validity - Low Level (-)	DC-AnalogL	√	J1A-20	←Analog (-)	Glideslope 1 Validity - Low Level (-)
Glideslope Manually Canceled Annunciator	Output	√	J1A-21	Lampout-6→	Glideslope Manually Canceled Discrete
GS-High Level (ARINC 578 (+))	DC-Analog		J1A-22	←429 Input (A)	429 input 6(A) GPS 1
GS-High Level (ARINC 578 (-))	DC-Analog		J1A-23	←429 Input (B)	429 input 6(B) GPS 1
Landing Flaps Position (+28VDC)	Discrete	√	J1A-24	←28vdisc	Landing Flaps Discrete (+28VDC)
Radio Altitude DH (Ground)	Discrete	√	J1A-25	←Gdisc	DH Discrete (Ground)
Program Pin Common	PWR/GND	√	J1A-26	←GND_PP	Program Pin Common
Aural Declutter Select	Progpín		J1A-27	←Progpín-11	Program Pin PP11

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
Max Audio Select/Bank Angle Enable	Progpín		J1A-28	←Progpín-12	Program Pin PP12
GPWS Modes Desense	Progpín		J1A-29	←Progpín-13	Program Pin PP13
Warning Computer Power Output (+)	PWR/GND	√	J1A-30	PWROUT (+)→	Warning Computer Power Output (+)
Warning Computer Power Output (-)	PWR/GND	√	J1A-31	PWROUTL (-)→	Warning Computer Power Output (-)
Alt Radio Altitude Scale Factor Select	Progpín		J1A-32	←Progpín-14	Program Pin PP14
High Level Direct Speaker Drive - 8Ω	Output	√	J1A-33	HL Audio Out (H)→	High Level Direct Speaker Drive - 8Ω
Envel-Mod In Sel #4/Airsp Scaling Sel Prog Pin (-04x only)	Progpín		J1A-34	←Progpín-15	Program Pin PP15
Envelope Modulation Input Select #3 (-04x only)	Progpín		J1A-35	←Progpín-16	Program Pin PP16
CAS Synchro: ARINC 545A/565 (X)	Synchro	√	J1A-36	←AC Analog3W1	CAS Synchro: ARINC 545A/565 (X)
CAS Synchro: ARINC 545A/565 (Y)	Synchro	√	J1A-37	←AC Analog3W2	CAS Synchro: ARINC 545A/565 (Y)
CAS Synchro: ARINC 545A/565 (Z)	Synchro	√	J1A-38	←AC Analog3W3	CAS Synchro: ARINC 545A/565 (Z)
DC Airspeed: ARINC 575 (+)	DC AnalogH	√	J1A-39	←DC Analog (+)	DC Airspeed (+)
DC Airspeed: ARINC 575 (-)	DC AnalogL	√	J1A-40	←DC Analog (-)	DC Airspeed (-)
Glideslope Enable or ILS Freq Selected (+28VDC)	Discrete	√	J1B-01	←28vdisc	ILS 1 Tuned (+28VDC)
Glideslope Mode Inhibit or ILS Back Course (+28VDC)	Discrete	√	J1B-02	←28vdisc	Glideslope Inhibit Discrete (+28VDC)
AC Power Input 115 VAC 400 Hz (H)	PWR/GND	√	J1B-03	←PWRH	AC Power Input 115 VAC 400 Hz (H)
AC Power Input 115 VAC 400 Hz (C)	PWR/GND	√	J1B-04	←PWRL	AC Power Input 115 VAC 400 Hz (C)
Chassis Ground	GND	√	J1B-05	←GND_C	Chassis Ground
Signal Ground (DC)	GND	√	J1B-06	←GND_S	Signal Ground
Landing Gear Position (+28VDC)	Discrete	√	J1B-07	←28vdisc	Landing Gear Discrete (+28VDC)
Audio Output Suppress Activation (+28V)	Discrete	√	J1B-08	←28vdisc	Audio Inhibit Discrete (+28V)
GPWS Warning Lamp No. 2	Output		J1B-09	Lampout-7→	Terrain Displayable #1 (DO#7) (to TERR lamp)
Automatic Backcourse Annunciator Lamp	Output		J1B-10	Lampout-8→	Terrain Displayable #2 (DO#8) (to TERR lamp)
GPWS Warning Lamp No. 1	Output	√	J1B-11	Lampout-9→	GPWS Warning Discrete (DO#9) (to red GPWS)
GPWS INOP Lamp	Output	√	J1B-12	Monitor Out→	GPWS INOP discrete (monitor) (to GPWS)
Low Level Inter phone Audio No. 1 (H)	Output	√	J1B-13	LLAud Out (H)→	Low Level Inter phone Audio No. 1 (H)
Low Level Inter phone Audio No. 1 (C)	Output	√	J1B-14	LLAud Out (L)→	Low Level Inter phone Audio No. 1 (C)
Alternate High Level Audio	Reserved		J1B-15	←GDisc	Flap Position Discrete #3 (Gnd)
Audio Output Suppress Activation (Ground)	Discrete	√	J1B-16	←GDisc	Audio Inhibit Discrete/Mom Audio Supp Disc
Low Level Inter phone Audio No. 2 (H)	Output	√	J1B-17	LLAud Out (H)→	Low Level phone Audio No. 2 (H)
Low Level Inter phone Audio No. 2 (C)	Output	√	J1B-18	LLAud Out (L)→	Low Level phone Audio No. 2 (C)
Radio Altimeter Validity (+28VDC)	28vDisc	√	J1B-19	←28vDisc	Radio Altitude Validity Discrete #1 (+28VDC)
Radio Altitude 1: ARINC 552 (+)	DC Analog	√	J1B-20	←S_Radio (+)	Radio Altitude 1: ARINC 552/ALT-55 (+)
Radio Altitude 1: ARINC 552 (-)	DC Analog	√	J1B-21	←S_Radio (-)	Radio Altitude 1: ARINC 552/ALT-55 (-)
Self Test Initiation (Ground)	Discrete	√	J1B-22	←GDisc	Self Test Discrete (Ground) (from GPWS PTT

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
Landing Gear Position (Ground)	Discrete	√	J1B-23	←GDisc	Landing Gear Discrete (Ground)
Landing Flaps Position (Ground)	Discrete	√	J1B-24	←GDisc	Landing Flaps Discrete (Ground) (Flaps
Auxiliary Aural Warning Discrete Out	Reserved		J1B-25	←GDisc	Flap Position Discrete #1 (Gnd)
Glideslope Validity (+28VDC)	Discrete	√	J1B-26	←28vDisc	Glideslope Validity Discrete #1 (+28VDC)
Barorate/Barometric Altitude Validity (+28V)	Discrete	√	J1B-27	←28vDisc	Barorate/Barometric Alt 1 Validity (+28V)
DC Barorate #1: ARINC 575/595 (Sig)	DC Analog	√	J1B-28	←S_DCBaro1 (Sig)	DC Barorate #1: 595 (Sig)
DC Barorate #1: ARINC 575/595 (+Ref)	DC Analog	√	J1B-29	←S_DCBaro2 (+Ref)	DC Barorate #1: 595 (+Ref)
DC Barorate #1: ARINC 575/595 (-Ref)	DC Analog	√	J1B-30	←S_DCBaro3 Ref)	DC Barorate #1: 595 (-Ref)
Glideslope 1 Deviation - Low Level (+ up)	DC Analog	√	J1B-31	←S_Glide (+)	Glideslope 1 Dev - Low Level (+up) (GS+DN)
Glideslope 1 Deviation - Low Level (+ down)	DC Analog	√	J1B-32	←S_Glide (-)	Glideslope 1 Dev - Low Level (+down)
Glideslope Alert Lamp	Output	√	J1B-33	Lampout-10→	Glideslope Alert Disc. (DO#10) (to BLW GS
Glideslope Mode Manual Inhibit (Cancel) (Ground)	Discrete	√	J1B-34	←GDisc	Glideslope Cancel Dis. (Gnd) (from GS
Alternate AC Barometric Rate (H)	Reserved		J1B-35	453 out (A)→	453 output 2(A) (Terrain Display Data #2)
Alternate AC Barometric Rate (C)	Reserved		J1B-36	453 out (B)→	453 output 2(B) (Terrain Display Data #2)
AC Barorate #1: ARINC 545A/565 (H)	AC Analog	√	J1B-37	←AC Analog (H)	AC Barorate #1: ARINC 545A/565 (H)
AC Barorate #1: ARINC 545A/565 (L)	AC Analog	√	J1B-38	←AC Analog (L)	AC Barorate #1: ARINC 545A/565 (L)
AC Barorate #1 Reference (H)	AC Analog	√	J1B-39	←AC Analog(H)	AC Barorate #1 Reference (H) (ref)
AC Barorate #1 Reference (L)	AC Analog	√	J1B-40	←AC Analog (L)	AC Barorate #1 Reference (L) (ref)
Windshear Caution Lamp	Output	√	J2-A01	Lampout-1→	Windshear Caution Dis. (DO#1) (to WS Caution lamp)
Windshear Warning Lamp	Output	√	J2-A02	Lampout-2→	Windshear Warning Disc. (DO#2) (to WS Warn lamp)
Windshear INOP Lamp	Output	√	J2-A03	Monitor Out→	Windshear INOP Disc. (Monitor) (to WS Inop Lamp)
Digital RS232 Port (Common)	Test	√	J2-A04	RS232-1→	Digital RS232 Port (Common)
Digital RS232 Port (Transmit)	Test	√	J2-A05	RS232-2→	Digital RS232 Port (Transmit)
Digital RS232 Port (Receive)	Test	√	J2-A06	RS232-3→	Digital RS232 Port (Receive)
Spare			J2-A07	←Prog-pin-20	Program Pin PP20
Spare			J2-A08	←Prog-pin-21	Program Pin PP21
Captain Guidance Select #1 +5VDC	Output		J2-A09	←Prog-pin-22	Program Pin PP22
Captain GSU Validity	DC Analog		J2-A10	←Prog-pin-6	Program Pin PP6
Captain Flag + 5VDC	Output		J2-A11	←Prog-pin-23	Program Pin PP23
Captain Roll Guidance Command (+)	Output		J2-A12	←Prog-pin-7	Program Pin PP7
Captain Command (-)	Output		J2-A13	←Prog-pin-24	Program Pin PP24
Captain Pitch Guidance Command (+)	Output		J2-A14	←Prog-pin-8	Program Pin PP8
Captain Fast Slow Command (+)	Output		J2-A15	←Prog-pin-9	Program Pin PP9

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
First Officer Fast-Slow Command (+)	Output		J2-B01	←Prog-pin-17	Program Pin PP17
First Officer Pitch Guidance Command (+)	Output		J2-B02	←Prog-pin-1	Program Pin PP1
First Officer Command (-)	Output		J2-B03	←Prog-pin-18	Program Pin PP18
First Officer Roll Guidance Command (+)	Output		J2-B04	←Prog-pin-2	Program Pin PP2
First Officer Flag +5VDC	Output		J2-B05	←Prog-pin-19	Program Pin PP19
First Officer GSU Validity	DC Analog		J2-B06	←Prog-pin-3	Program Pin PP3
Captain Guidance Deselect #1 (GND/Open)	Output		J2-B07	←Prog-pin-4	Program Pin PP4 (spare ppin)
+5 VDC Ground (Redundant to J1B-6)	GND		J2-B08	←GND__S	+5 VDC Ground (Redundant to J1B-6)
Spare			J2-B09	←Prog-pin-5	Program Pin PP5 (spare ppin)
Spare			J2-B10	←28vDisc	Radio Altitude Validity Discrete #3 (+28VDC)
Spare	Discrete		J2-B11	←S_Radio (+)	Radio Altitude 3: ARINC 552/ALT-55 (+)
First Officer Guidance Select #2 +5VDC	Output		J2-B12	←S_Radio (-)	Radio Altitude 3: ARINC 552/ALT-55 (-)
TCAS Inhibit	Output	√	J2-B13	Lampout-4→	TCAS Inhibit (Audio Inhibit) discrete (DO#4)
Guidance Deselect #2 (GND/OPEN)	Output		J2-B14	←429 input (A) ←422 input (A)	429 in 17 (A) Display Control Bus 2 (Range Input-1) RS-422 #1 (A) Display Control Bus 2 (Range Input-1)
	Reserved		J2-B15	←429 input (B) ←422 input (B)	429 in 17(B)Display Control Bus 2 (Range Input-1) RS-422 #1(B) Display Control Bus 2 (Range Input-1)
DC Ratio Angle of Attack (+) DC Angle of Attack #2 (+) Synchro Angle of Attack #2 (Y)	Dual	√	J2-C01	←Analog3W1	DC Ratio Angle of Attack (+) DC Angle of Attack #2 (+) Synchro Angle of Attack #2 (Y)
DC Ratio Angle of Attack (-) DC Angle of Attack #2 (-) Synchro Angle of Attack #2 (X)	Dual	√	J2-C02	←Analog3W2	Synchro Angle of Attack #2 (X)
Synchro Angle of Attack #2 (Z)	Dual	√	J2-C03	←Analog3W3	DC Ratio Angle of Attack (-) DC Angle of Attack #2 (-) Synchro Angle of Attack #2 (Z)
Stall Warning Stick Shaker #2 Simulator Reposition Discrete	Discrete	√	J2-C04	←Gdisc	Simulator Reposition Discrete
A/P Eng #2 (+28VDC/GND) INS Radio Update #2 (+28VDC)	Discrete		J2-C05	←28vdisc	Barometric Alt Rate #2 Validity (+28V)
Air Data Bus #2: ARINC 429 (A) Lo Speed ILS Bus: ARINC 429 (A) Lo Speed FMS Bus: ARINC 429 (A) Hi Speed2	Serial	√	J2-C06	←429/575 in (A)	429/575 input 1(A) Digital Air Data 2
Air Data Bus #2: ARINC 429 (B) Lo Speed ILS Bus: ARINC 429 (B) Lo Speed FMS Bus: ARINC 429 (B) Hi Speed2	Serial	√	J2-C07	←429/575 in (B)	429/575 input 1(B) Digital Air Data 2
IRS/INS Inertial Data #2: ARINC 429 (A) Hi Speed FMS #2: ARINC 429 (A) Hi Speed	Serial	√	J2-C08	←429 (A)	429 input 2(A) INS/FMS 2

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
IRS/INS Inertial Data #2: ARINC 429 (B) Hi Speed FMS #2: ARINC 429 (B) Hi Speed	Serial	√	J2-C09	←429 (B)	429 input 2 (B) INS/FMS 2
Serial Bus Output (A)	Output	√	J2-C10	429 (TX) out (A)→	429 output 1(A) (to EFIS SGs)
Serial Bus Output (B)	Output	√	J2-C11	429 (TX) out (B)→	429 output 1(B) (to EFIS SGs)
DC Ratio Total Air Temp. (TAT): Excitation Return	DC Analog	√	J2-C12	←S_TATRET	DC Ratio Total Air Temp. (TAT): Excitation Return
DC Shaker Margin #2 (-) Synchro Shaker Margin #2 (Y) Approach Slats #2 (+28VDC)	Dual		J2-C13	←429 input (A) 422 output (A)→	429 in 16(A) Display Control Bus 1 (Range-1 input) RS-422 #1TX (A) Display Control Bus 1 (output)
DC Shaker Margin #2 (+) Synchro Shaker Margin #2 (X) Takeoff Slats #2 (+28VDC)	Dual		J2-C14	←429 input (B) 422Txin (B)→	429 in 16(B) Display Control Bus 1 (Range-1 input) RS-422 #1 TX (B) Display Control Bus 1 (output)
Synchro Shaker Margin #2 (Z)	Dual		J2-C15	←Gdisc	Flap Position Discrete #2 (Gnd)
Synchro Flap/Slat Position #2 (Y) DC Selsyn Flap/Slat Position #2 (Y) - (Lear Flaps Disc)	Analog3W1	√	J2-D01	←Analog3W1	Synchro Flap Position #2 (Y) DC Selsyn Flap Position #2 (Y)
Synchro Flap/Slat Position #2 (X) DC Selsyn Flap/Slat Position #2 (X) - (Lear Flaps Disc)	Analog3W2	√	J2-D02	←Analog3W2	Synchro Flap Position #2 (X) DC Selsyn Flap Position #2 (X)
Synchro Flap/Slat Position #2 (Z) DC Selsyn Flap/Slat Position #2 (Z)	Analog3W3	√	J2-D03	←Analog3W3	Synchro Flap Position #2 (Z) DC Selsyn Flap Position #2 (Z)
Attitude #2 Validity (+28V)	Discrete	√	J2-D04	←28vdisc	Attitude #2 Validity (+28V)
Lear Flaps Discrete/Green Light #2 Reset	Discrete		J2-D05	←Gdisc	WXR On Discrete #2 (Gnd)
Calibrated IAS DC (Simulator) (+) DC Flap Angle (+)	DC Analog	√	J2-D06	←Analog (+)	Calibrated IAS DC (Simulator) (+) (ref) DC Flap Angle (+)
Calibrated IAS DC (Simulator) (-) DC Flap Angle (-)	DC Analog	√	J2-D07	←Analog (-)	Calibrated IAS DC (Simulator) (-) (ref) DC Flap Angle (-)
Fine Barometric Altitude #2 (X)	Synchro	√	J2-D08	←AC Analog3W1	Fine Barometric Altitude #2 (Y)
Fine Barometric Altitude #2 (Y)	Synchro	√	J2-D09	←AC Analog3W2	Fine Barometric Altitude #2 (X)
Fine Barometric Altitude #2 (Z)	Synchro	√	J2-D10	←AC Analog3W3	Fine Barometric Altitude #2 (Z)
Longi Accel Valid #2/Shaker Margin #2 Validity (28VDC)	Discrete	√	J2-D11	←28vdisc	Accel Valid Long (28V)
Baro Altitude Rate #2 Valid (+28VDC) Bias Self Test On (+28VDC=ST in Progress)	Discrete		J2-D12	←28vdisc	Accel Self Test in Progress (28v)
Pitch Attitude #2 (Y)	Synchro	√	J2-D13	←AC Analog3W1	Pitch Attitude #2 (Y)
Pitch Attitude #2 (X)	Synchro	√	J2-D14	←AC Analog3W2	Pitch Attitude #2 (X)
Pitch Attitude #2 (Z)	Synchro	√	J2-D15	←AC Analog3W3	Pitch Attitude #2 (Z)
Roll Attitude #2 (Y)	Synchro	√	J2-E01	←AC Analog3W1	Roll Attitude #2 (Y)
Roll Attitude #2 (X)	Synchro	√	J2-E02	←AC Analog3W2	Roll Attitude #2 (X)
Roll Attitude #2 (Z)	Synchro	√	J2-E03	←AC Analog3W3	Roll Attitude #2 (Z)

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
Normal Acceleration #2 (+) ± 9 Vdc AOA for HS 125-800 ac config 114 (+)	DC Analog	√	J2-E04	←Analog (+)	Normal Acceleration #2 (+) ± 9 Vdc AOA (Safeflight) for HS 125-800 (+)
Normal Acceleration #2 (-) ± 9 Vdc AOA for HS 125-800 ac config 114 (-)	DC Analog	√	J2-E05	←Analog (-)	Normal Acceleration #2 (-) ± 9 Vdc AOA (Safeflight) for HS 125-800 (-)
Longitudinal Acceleration #2 (+) SAT (absolute DC) (+) Coarse Altitude DC (Simulator, AZ-241) (+)	DC Analog	√	J2-E06	←Analog (+)	Longitudinal Acceleration #2 (+) (ref) SAT (absolute DC) (+) Coarse Altitude DC (Simulator, AZ-241) (+)
Longitudinal Acceleration #2 (-) SAT (Absolute DC) (-) Coarse Altitude DC (Simulator, AZ-241) (-)	DC Analog	√	J2-E07	←Analog (-)	Longitudinal Acceleration #2 (-) (ref) SAT (Absolute DC) (-) Coarse Altitude DC (Simulator, AZ-241) (-)
AC Flap Position Excitation #2 (H)	AC Analog	√	J2-E08	←AC Analog (H)	AC Flap Position Excitation #2 (H) (ref)
AC Flap Position Excitation #2 (C)	AC Analog	√	J2-E09	←AC Analog (L)	AC Flap Position Excitation #2 (C) (ref)
Program Pin Common (Redundant to J1A-26)	GND	√	J2-E10	←GND_PP	Program Pin Common (Redundant to J1A-26)
Spare			J2-E11	←GDisc	Flap Position Discrete #4 (Gnd)
AOA Vane #2 Validity (+28VDC/Ground) Stick Shaker #2 Discrete (+28VDC/Ground)	Discrete	√	J2-E12	←28Vdcdisc	AOA Vane #2 Validity (+28VDC)
Autopilot Engaged #1/ INS Radio Update #1 (+28VDC)	Discrete		J2-E13	←GDisc	Steep Approach Discrete #2 (Ground)
Lear Flaps Discrete / Guidance Deselect (GND) Alternate Lamp Format Enable (GND)	Discrete		J2-E14	←Gdisc	WXR On Discrete #1 (Ground)
Localizer Validity #1 (+28VDC)	Discrete	√	J2-E15	←28vdisc	Localizer Validity Discrete #1 (+28VDC)
Aircraft/Interface/Warn Threshold Select #1	Program Pin		J2-F01	(Monitor output)→	Terrain Display INOP Disc. (Monitor) (to TERR Inop Lamp)
Aircraft/Interface/Warn Threshold Select #2	Program Pin		J2-F02	Lampout-3→	Wx/EGPWC Disp. Sel Disc #2 (DO#3) (to relay)
Aircraft/Interface/Warn Threshold Select #3	Program Pin		J2-F03	spare	spare
Aircraft/Interface/Warn Threshold Select #4	Program Pin		J2-F04	←Gdisc	Altitude Callouts Enable Discrete
Aircraft/Interface/Warn Threshold Select #5	Program Pin		J2-F05	←S_DCAOA (+)	Special DC AOA #2 Input (+)
Aircraft/Interface/Warn Threshold Select #6	Program Pin		J2-F06	←S_DCAOA (-)	Special DC AOA #2 Input (-)
Aircraft/Interface/Warn Threshold Select #7	Program Pin		J2-F07	←Gdisc	Display Select Discrete #1 (from Momentary Sw)
Aircraft/Interface/Warn Threshold Select #8	Program Pin		J2-F08	←S_Radio (+)	Radio Altitude 2: ARINC 552/ALT-55 (+)
Aircraft/Interface/Warn Threshold Select #9	Program Pin		J2-F09	←S_Radio (-)	Radio Altitude 2: ARINC 552/ALT-55 (-)
Aircraft/Interface/Warn Threshold Select #10	Program Pin		J2-F10	←S_Glide (+up)	Glideslope 2 Dev - Low Level (+ up) (GS+DN)
Aircraft/Interface/Warn Threshold Select #11 (Parity)	Program Pin		J2-F11	←S_Glide (+down)	Glideslope 2 Dev - Low Level (+ down) (GS+UP)
Altitude Callout Vocabulary Select #5	Program Pin		J2-F12	←28vdisc	ILS 2 Tuned(+28VDC)
Altitude Callout Vocabulary Select #4	Program Pin		J2-F13	←GDisc	ILS Tuned Discrete #2 (Ground)
Altitude Callout Vocabulary Select #3	Program Pin		J2-F14	←Analog (+)	Glideslope 2 Validity - Low Level (+)
Altitude Callout Vocabulary Select #2	Program Pin		J2-F15	←Analog (-)	Glideslope 2 Validity - Low Level (-)

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
AOA Vane #2 Validity (+28VDC/Ground) Stichk Shaker #2 Discrete (+28VDC/Ground) INS Radio Update #1 (28VDC)	Discrete		J2-G01	←28vdisc	AOA #1 Validity Discrete (+28V)
Instrument Amp Valid #2 (Ground=Valid) (Int Conn to J1a in -04X)	Discrete		J2-G02	←28vDisc	Glideslope Validity Discrete #2 (+28VDC)
Accelerometer #1 Valid Norm (+28VDC) Shaker Margin #1b Validity (+28VDC)	Discrete	√	J2-G03	←28vdisc	Accel Valid Norm (+28V)
Altitude Call-out Voc Select #1 (Ground) (used as PP)	Discrete		J2-G04	←GDisc	Terrain Awareness & TCF Inhibit (Ground) (from TERR OVRD switch)
Airspeed Validity (+28V)	Discrete	√	J2-G05	←28vdisc	Airspeed Validity (+28V)
A/D Converter Reference Voltage (+) Alpha Vane Excitation DC Ratio Total Air Temp. (TAT) Excitation	PWR/GND	√	J2-G06	←5Vref+	A/D Converter Reference Voltage (+) Alpha Vane Excitation DC Ratio Total Air Temp. (TAT) Excitation
Analog to Digital Converter Reference Voltage (-)	PWR/GND	√	J2-G07	←5Vref-	Analog to Digital Converter Reference Voltage (-)
Windshear Alert/Warning Select	Program Pin		J2-G08	T_refH	AC zero cross timing reference 1H
Audio Volume Select #1	Program Pin		J2-G09	T_refL	AC zero cross timing reference 1L
Audio Volume Select #2	Program Pin		J2-G10	T_refH	AC zero cross timing reference 2H
Envelope Modulation Input Select #2	Program Pin		J2-G11	T_refL	AC zero cross timing reference 2L
Envelope Modulation Enable	Program Pin		J2-G12	←AnalogH	spare analog
Windshear Guidance Select	Program Pin		J2-G13	←AnalogL	spare analog
GPWS Flash Enable	Program Pin		J2-G14	←AnalogH	AC Flap Position Excitation #1 (H) (ref)
Simulator Installation	Program Pin		J2-G15	←AnalogL	AC Flap Position Excitation #1 (L) (ref)
DC Angle of Attack #1 (+)/Sync AOA #1 (X)	Dual	√	J2-H01	←Analog3W1	DC Angle of Attack #1 (+) Sync AOA #1 (X)
DC Angle of Attack #1 (-)/Sync AOA #1 (Y)	Dual	√	J2-H02	←Analog3W2	Sync AOA #1 (Y)
Synchro Angle of Attack #1 (Z)	Dual	√	J2-H03	←Analog3W3	Synchro Angle of Attack #1 (Z) DC Angle of Attack #1 (-)
Localizer #1 Deviation - Low Level (+)	DC Analog	√	J2-H04	←S_Localizer (+)	Localizer #1 Deviation - Low Level (+) (Loc+LF)
Localizer #1 Deviation - Low Level (-)	DC Analog	√	J2-H05	←S_Localizer (-)	Localizer #1 Deviation - Low Level (-) (Loc+RT)
AC Baro Alt Coarse Sync (Y) / DC Baro Altitude (+)	Dual	√	J2-H06	←Analog3W1	AC Baro Alt Coarse Sync (X) DC Baro Altitude (+)
AC Baro Alt Coarse Sync (X) / DC Baro Altitude (-)	Dual		J2-H07	←Analog3W2	AC Baro Alt Coarse Synchro (Y)
Reserved for Terrain Clearance Floor Enable (-04X Only)	Program Pin		J2-H08	←Analog3W3	AC Baro Alt Coarse Synchro (Z) DC Baro Altitude (-)
Envelope Modulation Input Select #1 (-04X Only)	Program Pin	√	J2-H09	←Gdisc	Display Select Disc. #2 (from TERR momentary sw)
AC Flap Position Excitation #1 (H)	AC Analog		J2-H10	←Analog (H)	Spare
AC Flap Position Excitation #1 (C)	AC Analog		J2-H11	←Analog (L)	Spare
Normal Acceleration #1: Bi-Axial Accelerometer (+)	DC Analog	√	J2-H12	←Analog (+)	Norm Accel #1: Bi-Axial Accelerometer (+)

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Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
Normal Acceleration #1: Bi-Axial Accelerometer (-)	DC Analog	√	J2-H13	←Analog (-)	Norm Accel #1: Bi-Axial Accelerometer (-)
Long Acceleration #1: Bi-Axial Accelerometer (+)	DC Analog	√	J2-H14	←Analog (+)	Long Accel #1: Bi-Axial Accelerometer (+)
Long Acceleration #1: Bi-Axial Accelerometer (-)	DC Analog	√	J2-H15	←Analog (-)	Long Accel #1: Bi-Axial Accelerometer (-)
DC Shaker Margin #1 (+) /Synchro Shaker Margin #1 (X) Takeoff Slats (+28VDC)	Dual		J2-J01	←Analog3W1	spare 3 wire analog 1
DC Shaker Margin #1 (-) / Synchro Shaker Margin #1 (Y) Approach Slats (+28VDC)	Dual		J2-J02	←Analog3W2	spare 3 wire analog 2
Synchro Shaker Margin #1 (Z)	Dual		J2-J03	←Analog3W3	spare 3 wire analog 3
DC Ratio Static Air Temperature (SAT) (+) DC Static Air Temperature (SAT) (+) DC Ratio Total Air Temperature (TAT) (R _{tat+})	Dual	√	J2-J04	←Analog (+)	DC Ratio Static Air Temperature (SAT) (+) DC Static Air Temperature (SAT) (+) DC Ratio Total Air Temperature (TAT) (R _{tat+})
DC Ratio Static Air Temperature (SAT) (-) DC Static Air Temperature (SAT) (-) DC Ratio Total Air Temperature (TAT) (R _{tat-})	Dual	√	J2-J05	←Analog (-)	DC Ratio Static Air Temperature (SAT) (-) DC Static Air Temperature (SAT) (-) DC Ratio Total Air Temperature (TAT) (R _{tat-})
DC Ratio Static Air Temperature (SAT) (REF-) DC Ratio Total Air Temperature (TAT) (R _{ref+})	Dual	√	J2-J06	←Analog H	DC Ratio Static Air Temp (SAT) (REF-) DC Ratio Total Air Temp (TAT) (R _{ref+})
DC Ratio Static Air Temperature (SAT) (REF+) DC Ratio Total Air Temperature (TAT) (R _{ref-})	Dual	√	J2-J07	←Analog L	DC Ratio Static Air Temp (SAT) (REF+) DC Ratio Total Air Temp (TAT) (R _{ref-})
Spare Synchro #1 (X)	Synchro	√	J2-J08	←AC Analog3W1	Spare Synchro #1 (X) (magnetic Track?)
Spare Synchro #1 (Y)	Synchro	√	J2-J09	←AC Analog3W2	Spare Synchro #1 (Y)
Spare Synchro #1 (Z)	Synchro	√	J2-J10	AC Analog3W3	Spare Synchro #1 (Z)
Stick Shaker #1a (Ground)/Vane Heater ON Disc (GND)	Discrete		J2-J11	←S_Localizer (+lf)	Localizer #2 Deviation - Low Level (+)
TO/GA #1 (+28VDC/Ground)	Discrete		J2-J12	←S_Localizer (+rt)	Localizer #2 Deviation - Low Level (-)
Synchro Flap/Slat Position #1 (X) Flap Range #1A (+28VDC) DC Selsyn Flap/Slat Position #1 (X)/ Lear Flaps Discrete	Dual	√	J2-J13	←Analog3W1	Synchro Flap Position #1 (X) DC Selsyn Flap Position #1 DC Flap Angle (+)
Synchro Flap/Slat Position #1 (Y) Flap Range #1B (+28VDC) DC Selsyn Flap/Slat Position #1 (Y) / Lear Flaps Discrete	Dual	√	J2-J14	←Analog3W2	Synchro Flap Position #1 (Y) DC Selsyn Flap Position #1 (Y)
Synchro Flap/Slat Position #1 (Z) DC Selsyn Flap/Slat Position #1 (Z)	Dual	√	J2-J15	←Analog3W3	Synchro Flap Position #1 (Z) DC Selsyn Flap Position #1 (Z) DC Flap Angle (-)
Synchro Pitch Attitude #1 (X)	Synchro	√	J2-K01	←AC Analog3W1	Synchro Pitch Attitude #1 (X)
Synchro Pitch Attitude #1 (Y)	Synchro	√	J2-K02	←AC Analog3W2	Synchro Pitch Attitude #1 (Y)
Synchro Pitch Attitude #1 (Z)	Synchro	√	J2-K03	←AC Analog3W3	Synchro Pitch Attitude #1 (Z)
AC Ratio Barometric Altitude Rate #2 (Signal+)	Dual	√	J2-K04	←Analog (Sig+)	AC Ratio Barometric Altitude Rate #2 (Signal+)
AC Ratio Barometric Altitude Rate #2 (Signal-)	Dual	√	J2-K05	←Analog (Sig-)	AC Ratio Barometric Altitude Rate #2 (Signal-)

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MK VII EGPWS Installation Design Guide

Signal Name –MK-VII GPWS	Signal Type	Same	Conn/Pin	Signal Type ←IN OUT →	Signal Name –MK-VII EGPWS (Enhanced)
AC Ratio Barometric Altitude Rate #2 (REF+)	Dual	√	J2-K06	←Analog (Ref+)	AC Ratio Barometric Altitude Rate #2 (ref)
AC Ratio Barometric Altitude Rate #2 (REF-)	Dual	√	J2-K07	←Analog (Ref-)	AC Ratio Barometric Altitude Rate #2 (ref)
Air Data Bus#1: (A) ARINC 429/575 Lo Speed DAU Air Data (A) ARINC 429 Hi Speed	Serial	√	J2-K08	←429 (A)	429/575 input 3(A) Digital Air Data 1
Air Data Bus#1: (B) ARINC 429/575 Lo Speed DAU Air Data (A) ARINC 429 Hi Speed	Serial	√	J2-K09	←429 (B)	429/575 input 3(B) Digital Air Data 1
Accelerometer Self Test Output	Output		J2-K10	Accel_out→	Accelerometer Self Test initialization Output
Attitude #1 Validity (+28VDC)	Discrete	√	J2-K11	←28vdisc	Attitude #1 Validity (+28V)
Instrument Amp #1 Validity (Ground) Magnetic Heading Validity (Ground)	Discrete		J2-K12	←28vdisc	Localizer Validity Discrete #2 (+28VDC)
Roll Attitude #1 (X)	Synchro	√	J2-K13	←AC Analog3W1	Roll Attitude #1 (X)
Roll Attitude #1 (Y)	Synchro	√	J2-K14	←AC Analog3W2	Roll Attitude #1 (Y)
Roll Attitude #1 (Z)	Synchro	√	J2-K15	←AC Analog3W3	Roll Attitude #1 (Z)

Appendix A: Sample Wiring Diagrams

Sample wiring diagrams are provided for reference only. The table below shows the Aircraft Types and aircraft models represented.

Aircraft Type	Aircraft Model
4	Citation V, MK VII EGPWS, Primus EPIC Display
38	Gulfstream GII, MK VII EGPWS, Primus EPIC Display
6	Boeing 727-200 with Collins WXI-711 PPI Display
5	MD-80 with Honeywell EFIS Display, VG/DG, no W/S
5	MD-90 with Honeywell EFIS Display, IRS, no W/S
5	DC-10 with Dual PPI-4B Radar Display's, w/o RWS, with PWS
14	DC-10 Dual Collins WXI-711 PPI Display with W/S
3	Convair 340-31 with RAAS Inhibit

APPENDIX A: SAMPLE WIRING DIAGRAMS..... 124

Citation V, MK VII EGPWS, Primus EPIC Display.....

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Gulfstream GII, MK VII EGPWS, Primus EPIC Display.....

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Boeing 727-200 with Collins WXI-711 PPI Display.....

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MD-80 with Honeywell EFIS Display, VG/DG, no W/S.....

128

MD-90 with Honeywell EFIS Display, IRS, no W/S

129

DC-10 with Dual PPI-4B Radar Display's, w/o RWS, W/PWS Interface

130

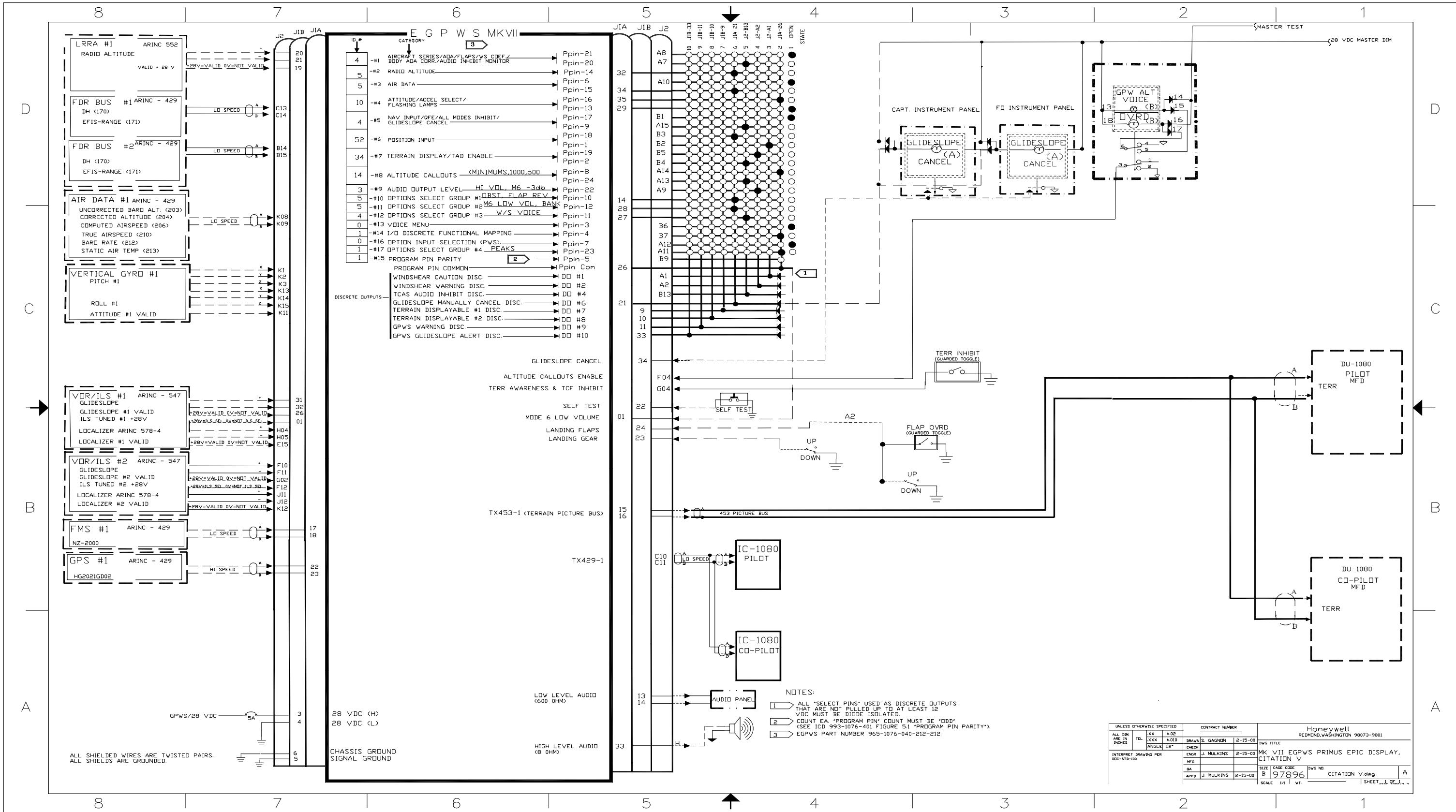
DC-10 Dual Collins WXI-711 PPI Display with W/S

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Convair 340-31 with RAAS Inhibit.....

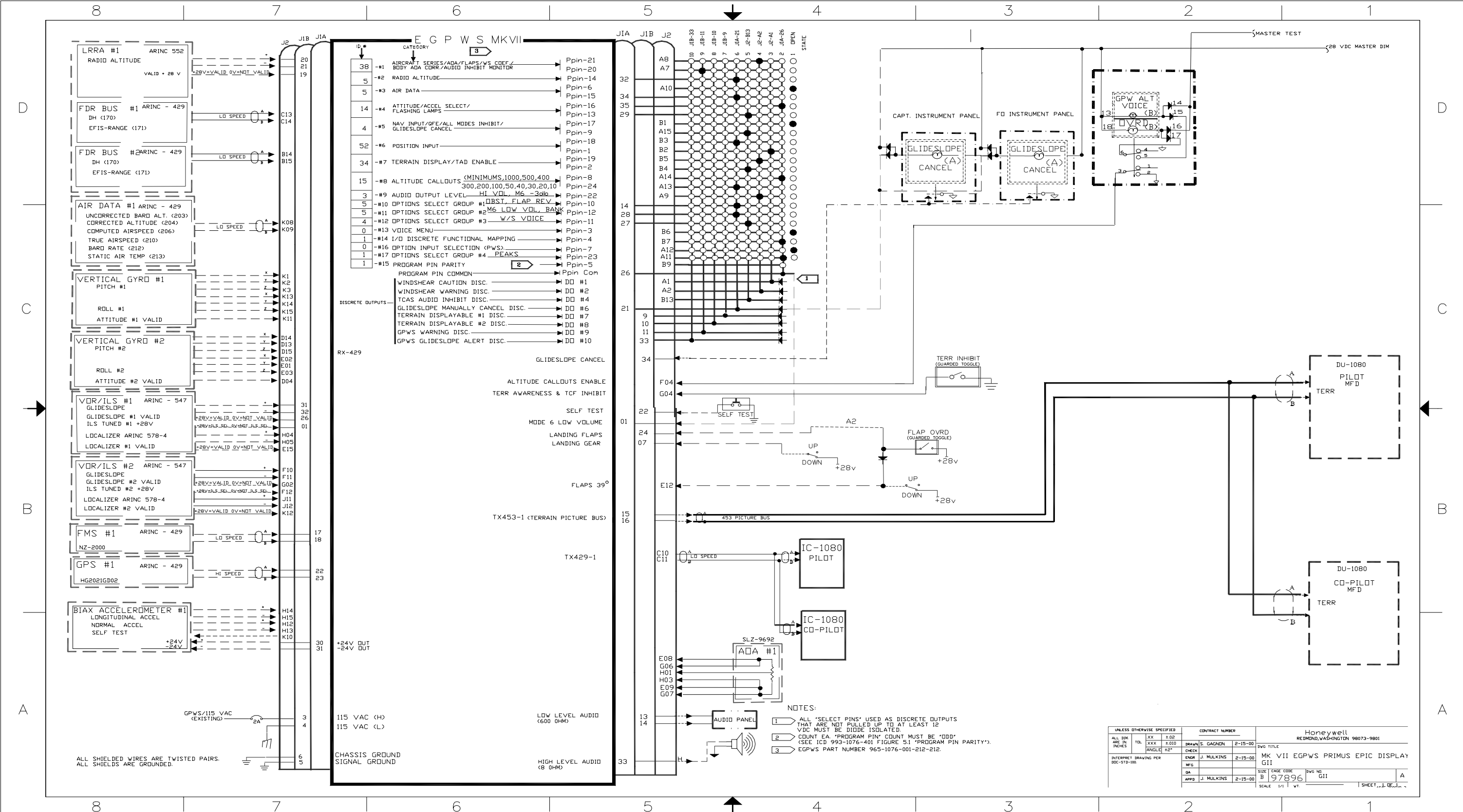
132

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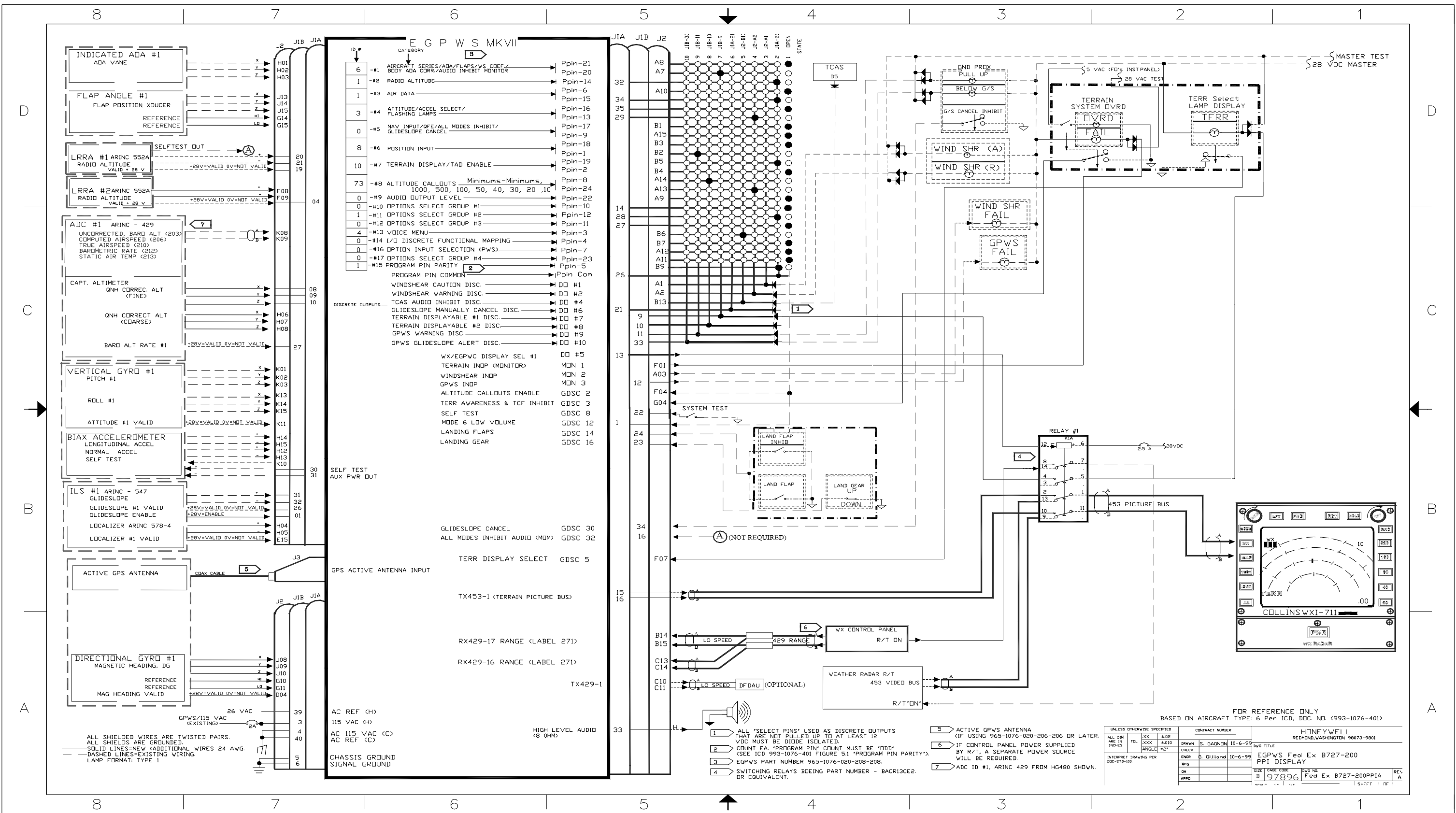


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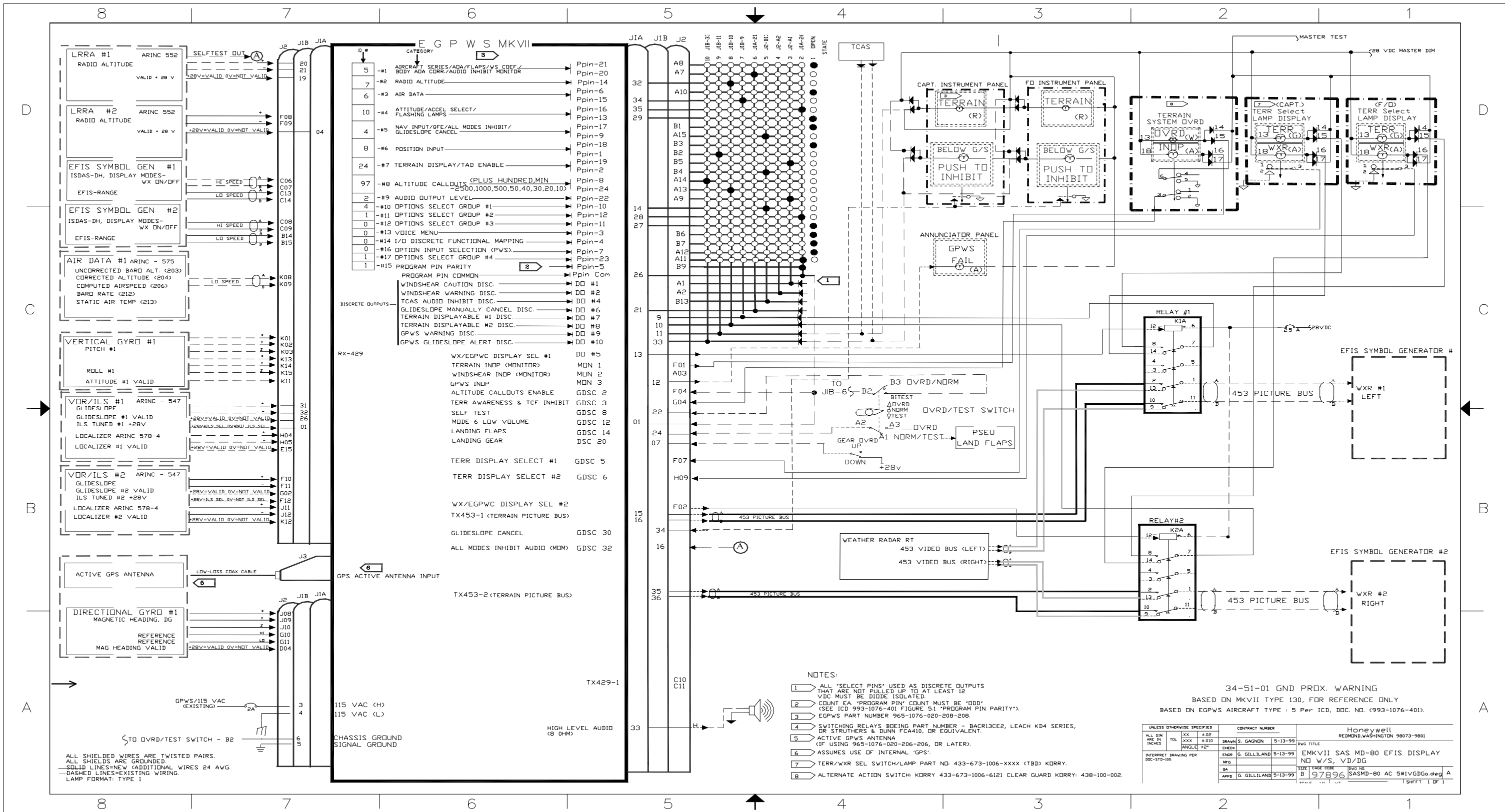
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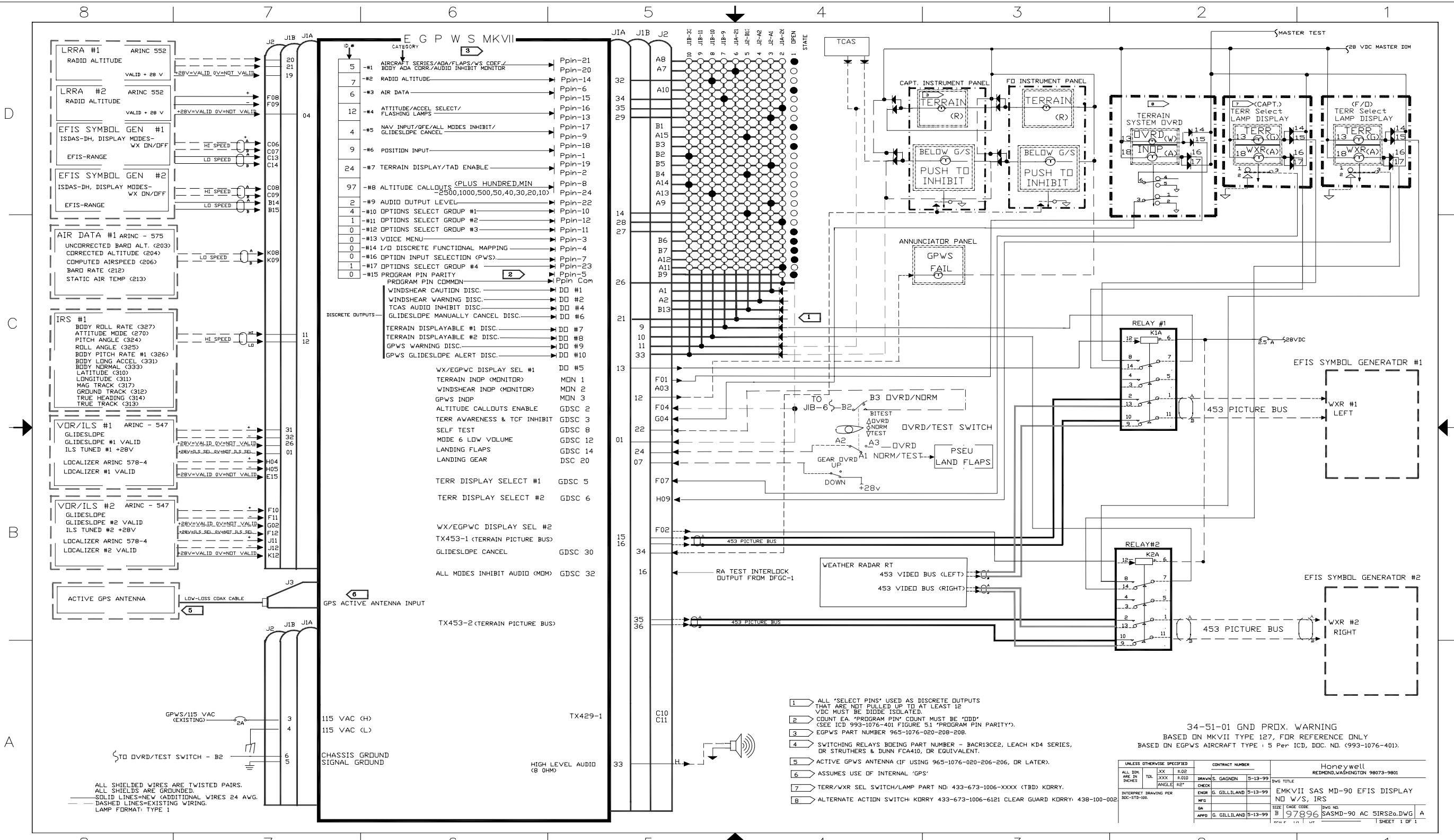


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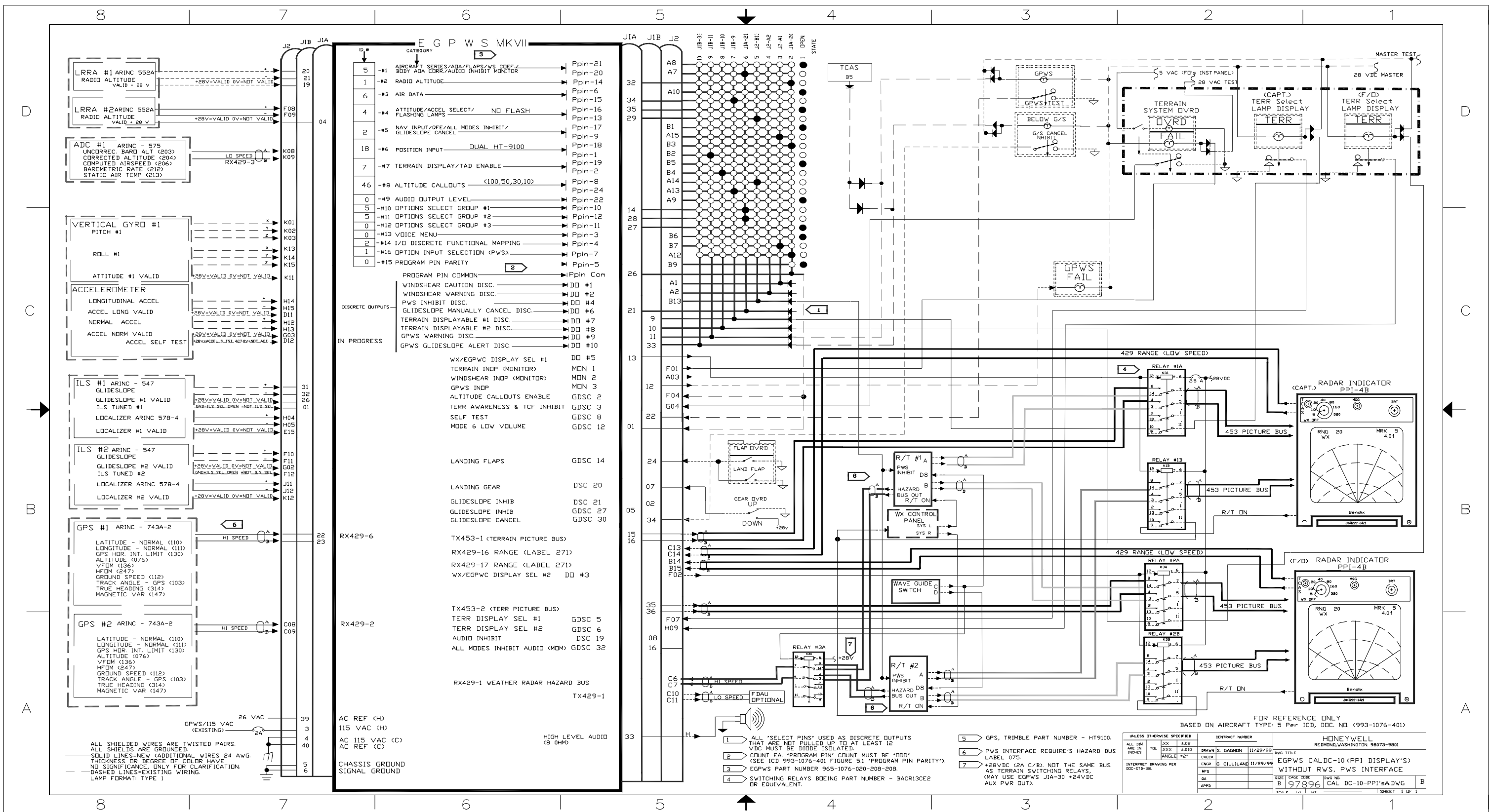


Honeywell

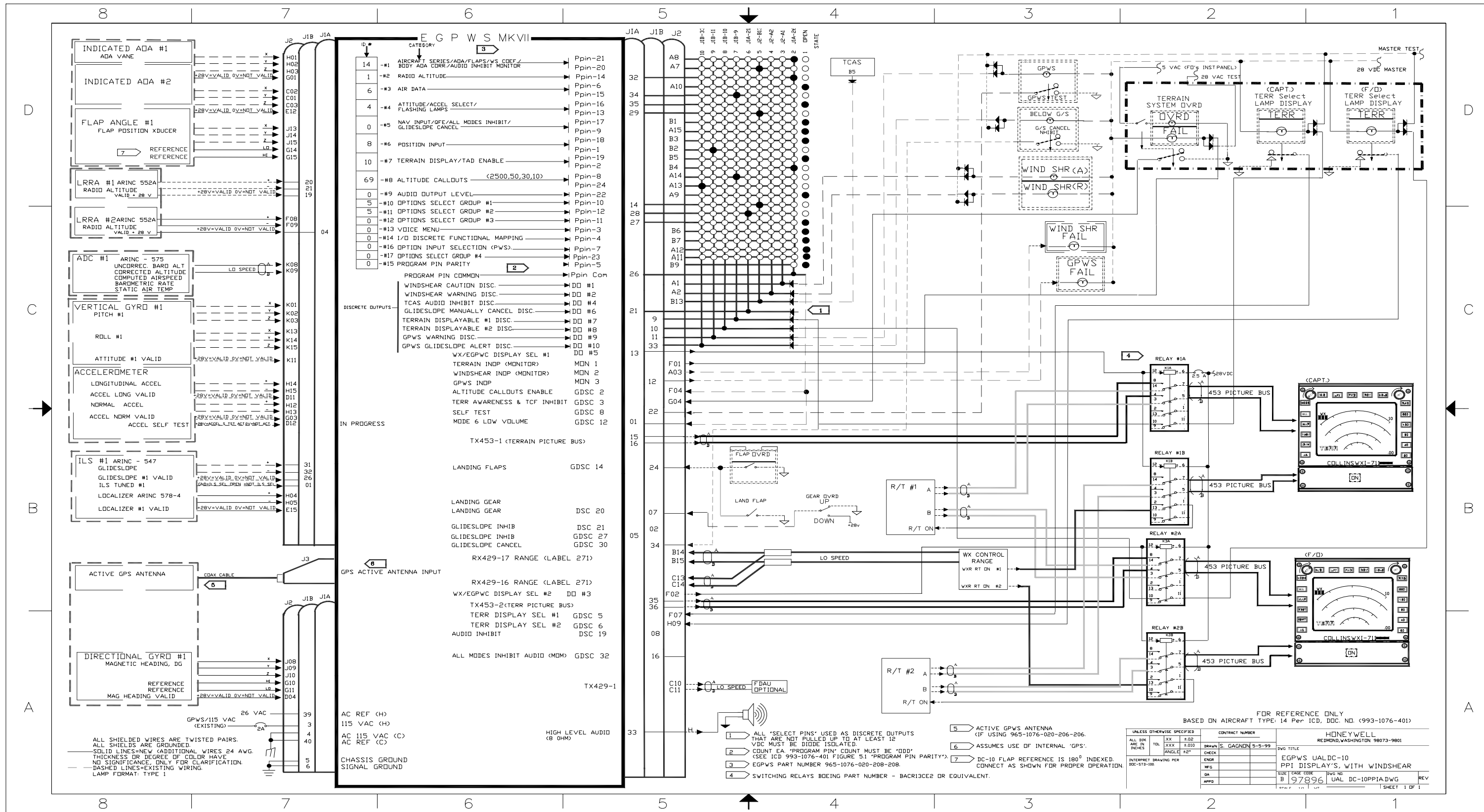
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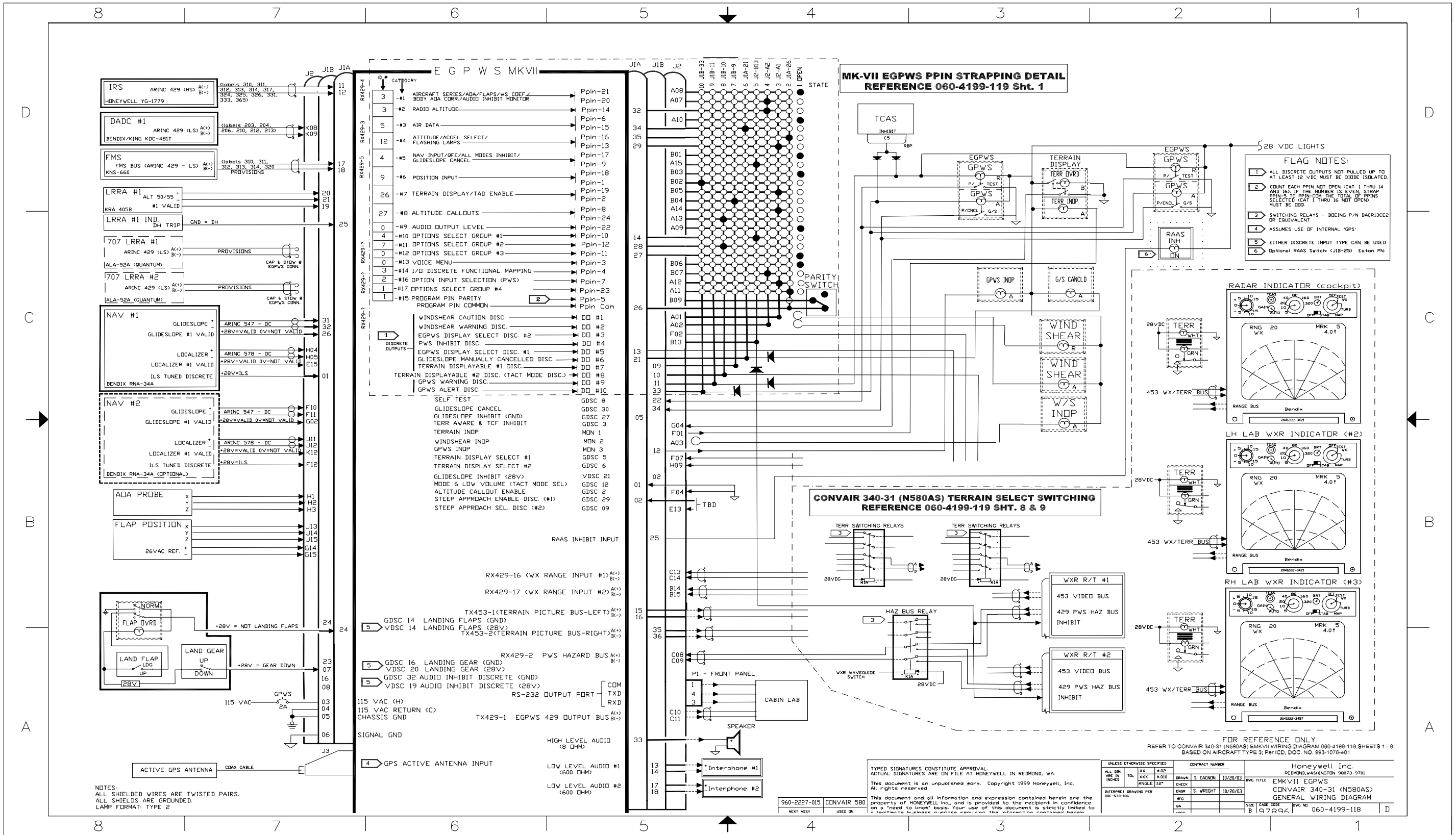
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Appendix B – Customer Worksheets

APPENDIX B – CUSTOMER WORKSHEETS	133
MARK VII CUSTOMER WORK SHEET	134
RUNWAY AWARENESS ADVISORY SYSTEM (RAAS) CONFIGURATION DATABASE WORKSHEET	136



EGPWS

ENHANCED GROUND PROXIMITY WARNING SYSTEM

Mark VII CUSTOMER WORK SHEET

The purpose of this Work Sheet is to obtain the necessary aircraft data to develop aircraft specific interface configurations to support the installation of the Enhanced Ground Proximity Warning Computer (EGPWC).

Aircraft Operator:	Installer: Contact: _____ Phone: _____
Aircraft Type (Ex. B737-200ADV):	Current GPWS Altitude Callout Menu:
Aircraft Serial Number(s) / Registration Number(s):	

Aircraft Systems Information:

Please provide the following information as applicable:

Example:

Radio Altimeter	Manufacturer: AlliedSignal *Format of Data: ARINC 429	Model/Part Number: ALA52A / 2041166-5204 # of sources available for EGPWC use: 3
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* Format of Data: Specify Digital, DC, or AC etc., and the applicable ARINC specification, which it meets (i.e. 429, 575, 552, etc).

Existing GPWS	Manufacturer: Windshear Detection Enabled? Yes()No()	Model/Part Number:
Radio Altimeter	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
Air Data Computer	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
FMC	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
IRS / INS / VG (select correct input)	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
Directional Gyro (if applicable)	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
GPS	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
VOR/ILS	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
Stall Warning	Manufacturer: Format of Data:	Model/Part Number: # of sources available for EGPWC use:
Angle of Attack (AOA)	Manufacturer: Format:	Model/Part Number: # of sources available for EGPWC use:

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A. Aircraft Cockpit Architecture for EFIS Equipped Aircraft:

Please provide the following information as applicable:

EFIS Display	Manufacturer:	Model/Part Number:
MFD	Manufacturer:	Model/Part Number:
EICAS	Manufacturer:	Model/Part Number:
EFIS Symbol Generators	Manufacturer:	Model/Part Number:
EFIS Control Panel	Manufacturer:	Model/Part Number:

B. Aircraft Cockpit Architecture for Non-EFIS Equipped Aircraft:

Please provide the following information as applicable:

Weather Radar Display	Manufacturer: Single or Dual Display Configuration:	Model/Part Number:
Weather Radar	Manufacturer: Single or Dual Radar Configuration:	Model/Part Number
Display Range Selection (WXR Control Panel)	Source: Format of Data:	WXR Ranges (Ex. 10, 20, 40nm, etc):

C. Aircraft Flap & Landing Gear data:

Landing Gear Down	☐ Gnd / Open		
Landing Flaps	☐ Gnd / Open	☐ +28 VDC/Open	Synchro
Flap Angle	☐ Digital ☐ +28 VDC Discretes	☐ 3 Wire Synchro ☐ Gnd Discretes	

Please return completed worksheet to the assigned Honeywell Sales and Marketing Representative or to:

Honeywell International Inc.
Aerospace Electronics Systems
Enhanced GPWS Products
Fax: 877-484-2981
Email: CRC-CES-TAG@Honeywell.com

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MK VII EGPWS Installation Design Guide

RUNWAY AWARENESS ADVISORY SYSTEM (RAAS) CONFIGURATION DATABASE WORKSHEET

There are two parts to this worksheet. To have RAAS enabled, each individual aircraft type must be listed in Part B. This page contains notes to aid in filling out the following worksheet. To complete a worksheet, go to the EGPWS website (<http://www.honeywell.com/sites/servlet/com.merx.npoint.servlets.DocumentServlet?docid=D32178F4F-78A5-63A1-BD9D-666750CF08DD>) and submit the completed form.

Enter data by mouse clicking in the desired box, then typing information or using the up/down arrows to make a selection. Click on the Acrobat Text Select Tool icon if the worksheet appears unresponsive.

NOTE 1: All options in Step 1 (Part A) must be completed. Worksheets with blank selections CANNOT be accepted.

NOTE 2: MK VII EGPWS Type is one of the following part numbers: 965-1076-XXX-XXX-XXX

NOTE 3: A/C Type number is the 2 or 3-digit aircraft-type number defining the EGPWS installation. This number can be found using one of the following methods:

- Conducting a Level 3 Self-Test on the aircraft per *Line Maintenance Manual - MK V, MK VI, MK VII, MK VIII; Enhanced Ground Proximity Warning System*, Honeywell Document 060-4199-180.
- Examining EGPWS-aircraft program pin wiring against the *Interface Control Document (ICD) for the Mark VII Enhanced Ground Proximity Warning System (MK VII EGPWS)*, 993-1076-401.

NOTE 4: MK VII Aircraft-Types 3, 4, 5, 7 are generic, non-windshear aircraft types that can be used with multiple airframes. For example, MK VII EGPWS A/C Type 5 is a generic, Air Transport, non-windshear configuration that may be used on DC-9-32, B747-200 and A300B4-200 aircraft. The RCD will not distinguish between aircraft models, only aircraft-type number. If more than one aircraft model has EGPWS installed and is using a MK VII generic aircraft type, then multiple RCDs will be required. Complete the worksheet listing all aircraft using the generic aircraft-types and send to Honeywell for evaluation.

NOTE 5: Enter the distance GPS antenna is located from nose of aircraft to center of antenna rounded up to the nearest 5 foot. (i.e. If distance measured is 11 feet, then round up to 15 feet).

NOTE 6: RAAS Short and Insufficient Runway Advisories do not take into account aircraft performance factors such as aircraft weight, wind, runway condition, slope, air temperature and altitude of airport. This is an informational advisory that is intended to enhance flight crew awareness by identifying that the runway length available may be marginal for the aircraft type.

Nominal Runway Lengths: Enter value rounded up to the nearest 100-ft (30-metres). If advisory is turned OFF in Part A, leave blank. If available runway length is to always be annunciated, then enter ALWAYS.

The RAAS algorithm processes distances in feet. If the operator selects the Metres option, and the nominal runway lengths listed in Part B are in meters, Honeywell will convert the metres value into feet using the formula (Feet = Metres x 3.280839895). When the advisories are triggered, the algorithm recalculates and provides distance advisories in metres.

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MK VII EGPWS Installation Design Guide

Complete ALL of **PART A: Selection Boxes**

Aircraft Operator:		Date:	
Customer Name/Company:		P.O. #:	
Customer Phone/fax/email:			
HONEYWELL USE ONLY:			

Complete PART A: Global Options (applicable to all aircraft)

DESCRIPTION (reference the Product Description section in brackets for more details)	OPTIONS	SELECTION - *Note 1 CLICK IN BLANK BOX, MAKE SELECTION VIA UP/DOWN ARROWS YOU MUST CLICK IN BOX AFTER SELECTING BEFORE GOING TO NEXT BOX
Distance unit of measure (All Advisories)	Select Feet or Metres in the box	☐ Feet ☐ Metres
Voice Gender (All Advisories)	Select Female or Male in the box	☐ Female ☐ Male
Approaching Runway - In Air (4.1)	Select ON or OFF in the box	☐ ON ☐ OFF
Advisory Suppress Window (4.1)	Select 450-550 ft or 350-450 ft in the box	
Distance remaining, Landing & Roll-out (4.4)	Select ON or OFF in the box	☐ ON ☐ OFF
Runway End Advisory (4.5)	Select ON or OFF in the box	☐ ON ☐ OFF
Approaching Short Runway Length - In Air Advisory (5.1)	Select ON (and enter Nominal Runway Length in Part B for each aircraft type) or OFF or ALWAYS (length always voiced)	☐ ON ☐ OFF ☐ ALWAYS
Insufficient Runway Length – On Ground Advisory (5.2)	Select ON (and enter Nominal Runway Length in Part B for each aircraft type) or OFF or ALWAYS (length always voiced)	☐ ON ☐ OFF ☐ ALWAYS
Extended Holding Time on Runway, initial (5.3)	Enter value of 60, 90, 120, 180, 240, 300, seconds or OFF in the box	
Extended Holding Time on Runway, repeats (5.3)	Enter value of 30, 60, 90, 120, 180, 240, 300, seconds or OFF in the box	
Taxiway Take Off (5.4)	Select ON or OFF in the box	☐ ON ☐ OFF
Distance Remaining - Rejected Take-Off (5.5)	Select ON or OFF in the box	☐ ON ☐ OFF
RAAS Inhibit Discrete	Select ON or OFF in the box	☐ ON ☐ OFF

Complete PART B: Individual Aircraft-Type Options

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*** If units of distance is Metres, then distances will be converted to feet using the formula (ft. = Metres × 3.280839895).**

Notes 1 to 5 are listed on page 136 of this Appendix.